Report No. 665a-BR

Rural Development Issues and Options in Northeast Brazil

June 23, 1975

Latin America and the Caribbean Region

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International Development Association

CURRENCY EQUIVALENT

Currency Unit: Cruzeiro

Exchange Rates Effective May 13, 1975

Selling Rate:	US$1.00	Cr$7.975
	US$1 million	Cr$7,975,000
	Cr$1 million	Cr$125,392
Buying Rate:	US$1.00	Cr$7.925

Average Exchange Rates (Selling)

	1973	1974
US$1.000	Cr$6.126	Cr$6.794
US$1 million	Cr$6,126,000	Cr$6,794,000
Cr$1 million	US$163,239	Cr$147,188

This report is based on the findings of a special economic mission which visited Brazil in May-June 1974. The mission was composed of Messrs. R. Echeverria (Chief of mission), P. Scandizzo and C. Cronberg (IBRD), Mr. A. Thieme (Inter-American Development Bank), Ms. J. Tendler and Messrs. D. Goodman and W. Cline (Consultants). Mr. W. Price (IBRD) collaborated in the preparation of the report in Washington.

RURAL DEVELOPMENT ISSUES AND OPTIONS IN NORTHEAST BRAZIL

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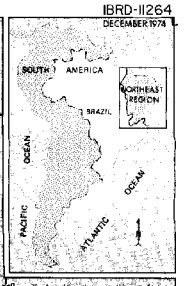

PARÁ
MARANHÃO
PIAUÍ
CEARÁ
RIO GRANDE DO NORTE
PARAIBA
PERNAMBUCO
ALAGOAS
SERGIPE
BAHIA
GOIÁS
MINAS GERAIS
ESPIRITO SANTO

São Luís
Fortaleza
Natal
João Pessoa
Recife
Maceió
Aracaju
Salvador

ATLANTIC OCEAN

FEDERAL DISTRICT
BRASILIA

PHYSIOGRAPHIC ZONES:
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KILOMETERS

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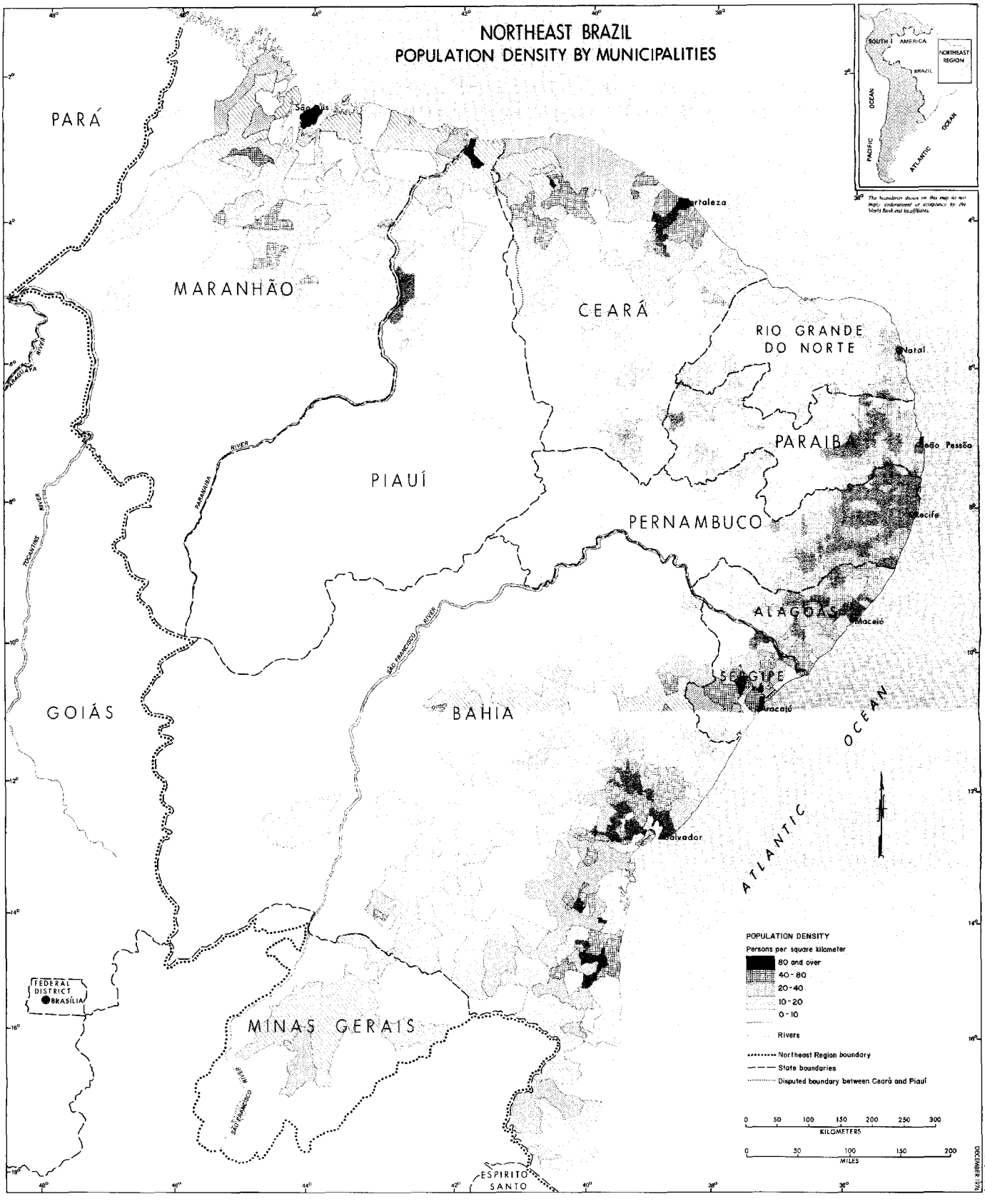
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POPULATION DENSITY BY MUNICIPALITIES
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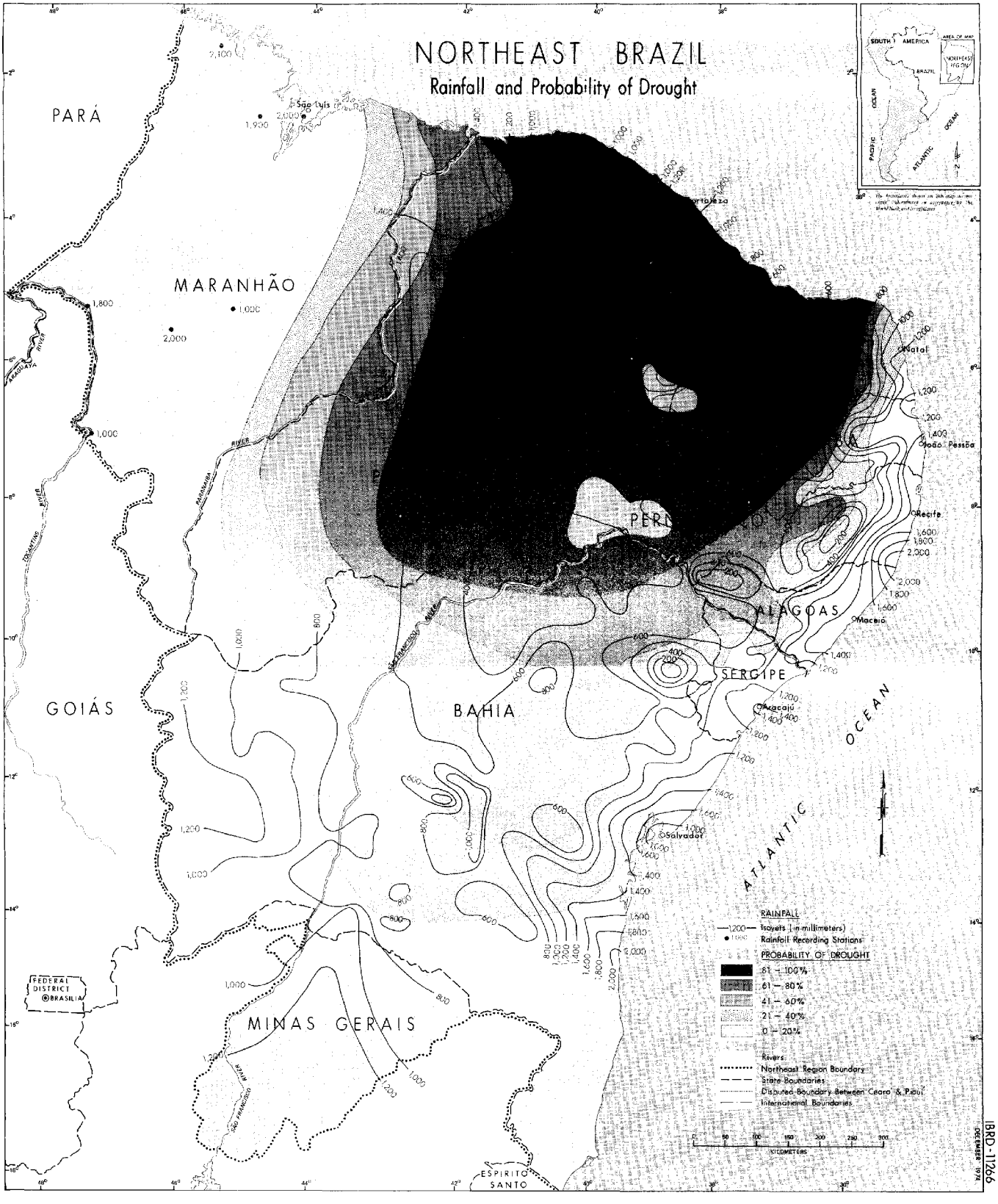
FEDERAL DISTRICT
ATLANTIC OCEAN
SOUTH AMERICA
NORTHEAST REGION
BRAZIL
PACIFIC OCEAN
ATLANTIC OCEAN
The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.
POPULATION DENSITY
Persons per square kilometer
80 and over
40 - 80
20 - 40
10 - 20
0 - 10
Rivers
Northeast Region boundary
State boundaries
Disputed boundary between Ceará and Piauí
0 50 100 150 200 250 300
KILOMETERS
0 50 100 150 200
MILES
IBRD 11265
DECEMBER 1974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Rainfall and Probability of Drought
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RAINFALL
Isohyets (in millimeters)
Rainfall Recording Stations
PROBABILITY OF DROUGHT
81 – 100%
61 – 80%
41 – 60%
21 – 40%
0 – 20%
Rivers
Northeast Region Boundary
State Boundaries
Disputed Boundary Between Ceara & Piaui
International Boundaries
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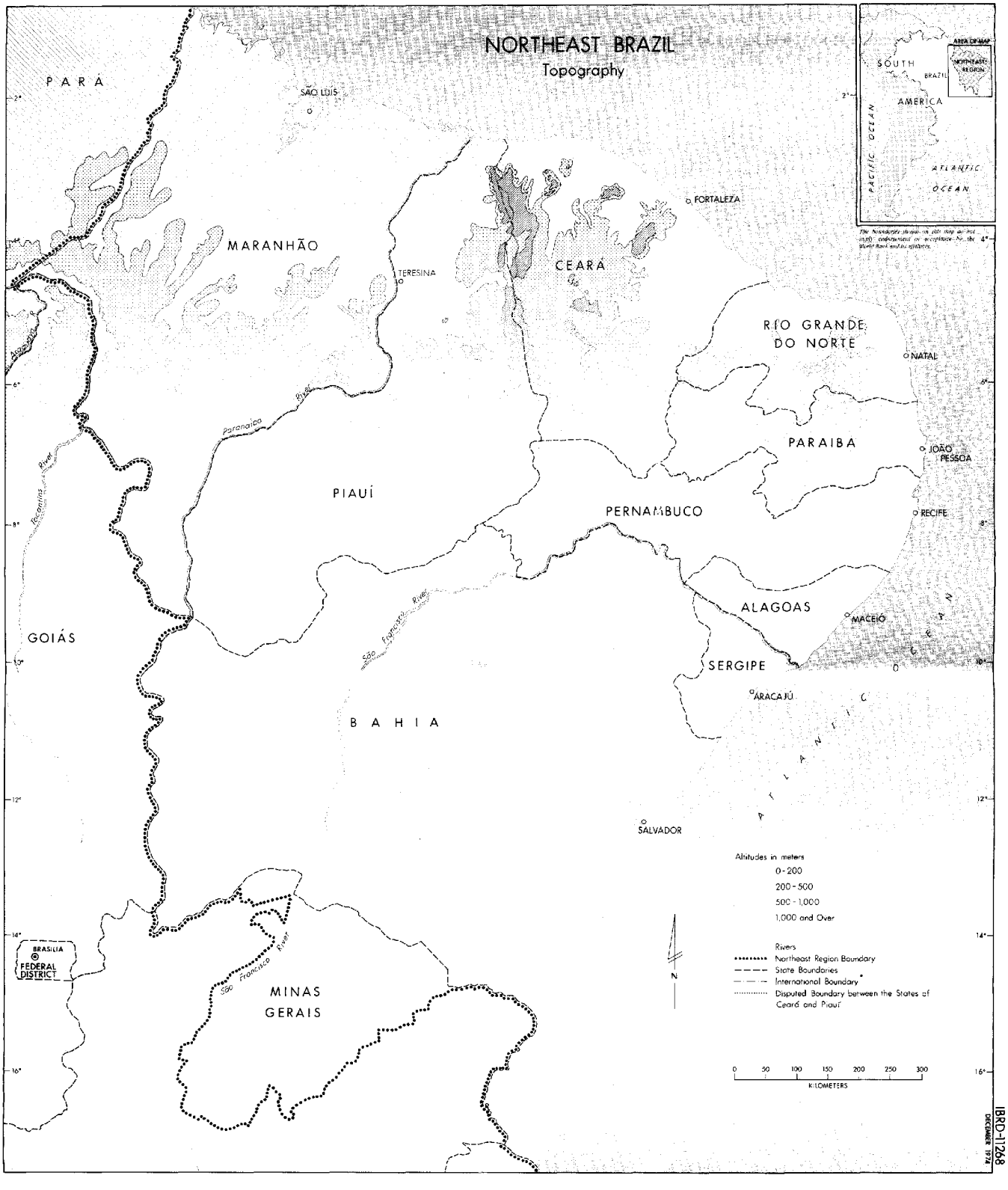
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MARANHÃO
TERESINA
CEARÁ
FORTALEZA
RIO GRANDE DO NORTE
NATAL
PARAIBA
JOÃO PESSOA
PIAUÍ
PERNAMBUCO
RECIFE
ALAGOAS
MACEIÓ
SERGIPE
ARACAJÚ
GOIÁS
BAHIA
SALVADOR
BRASILIA
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MINAS GERAIS
Parnaíba River
Parnaíba River
São Francisco River
São Francisco River
AREA OF MAP
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SOUTH AMERICA
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PACIFIC OCEAN
ATLANTIC OCEAN
Altitudes in meters
0 - 200
200 - 500
500 - 1,000
1,000 and Over
Rivers
Northeast Region Boundary
State Boundaries
International Boundary
Disputed Boundary between the States of Ceará and Piauí
N
0 50 100 150 200 250 300
KILOMETERS
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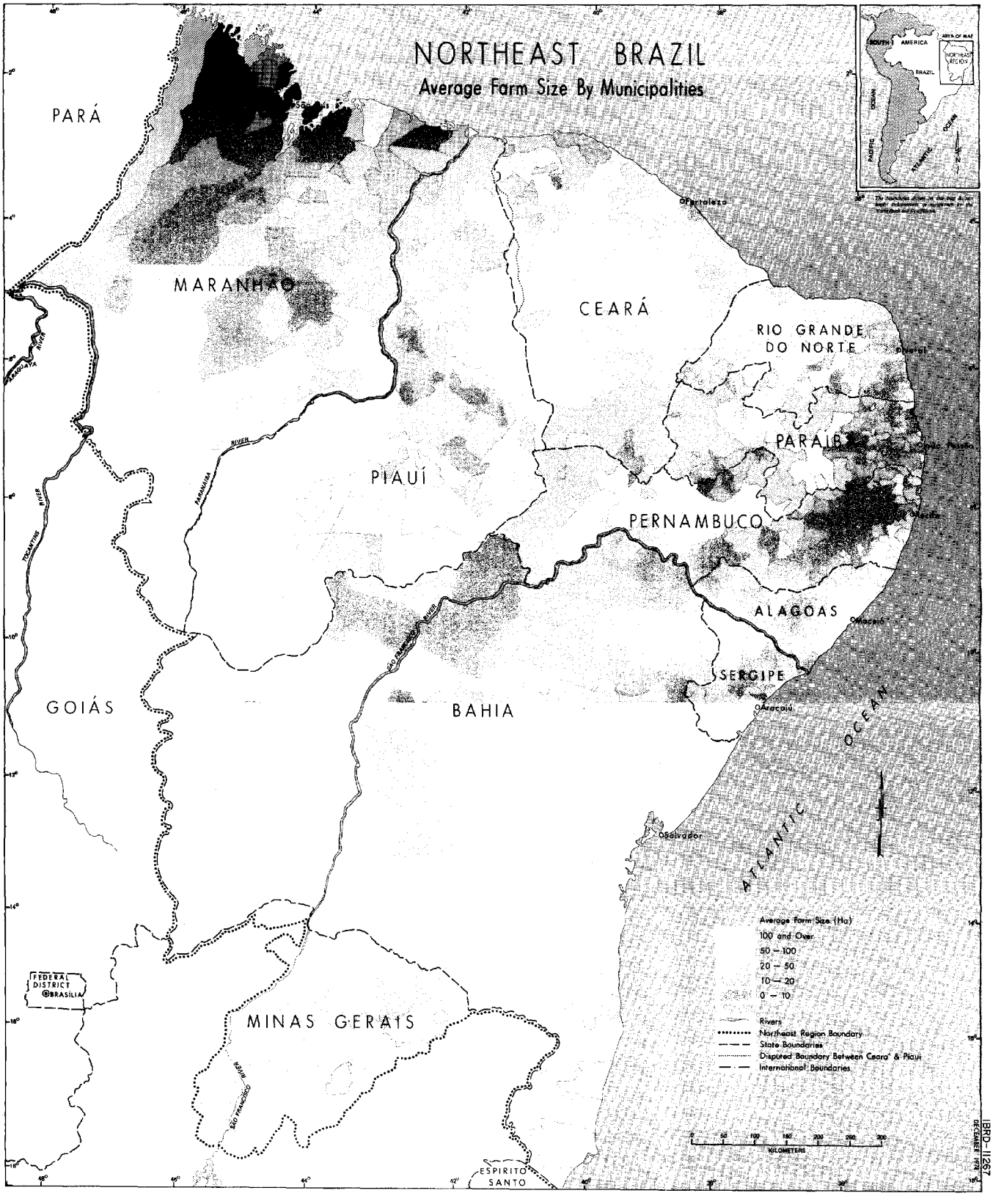

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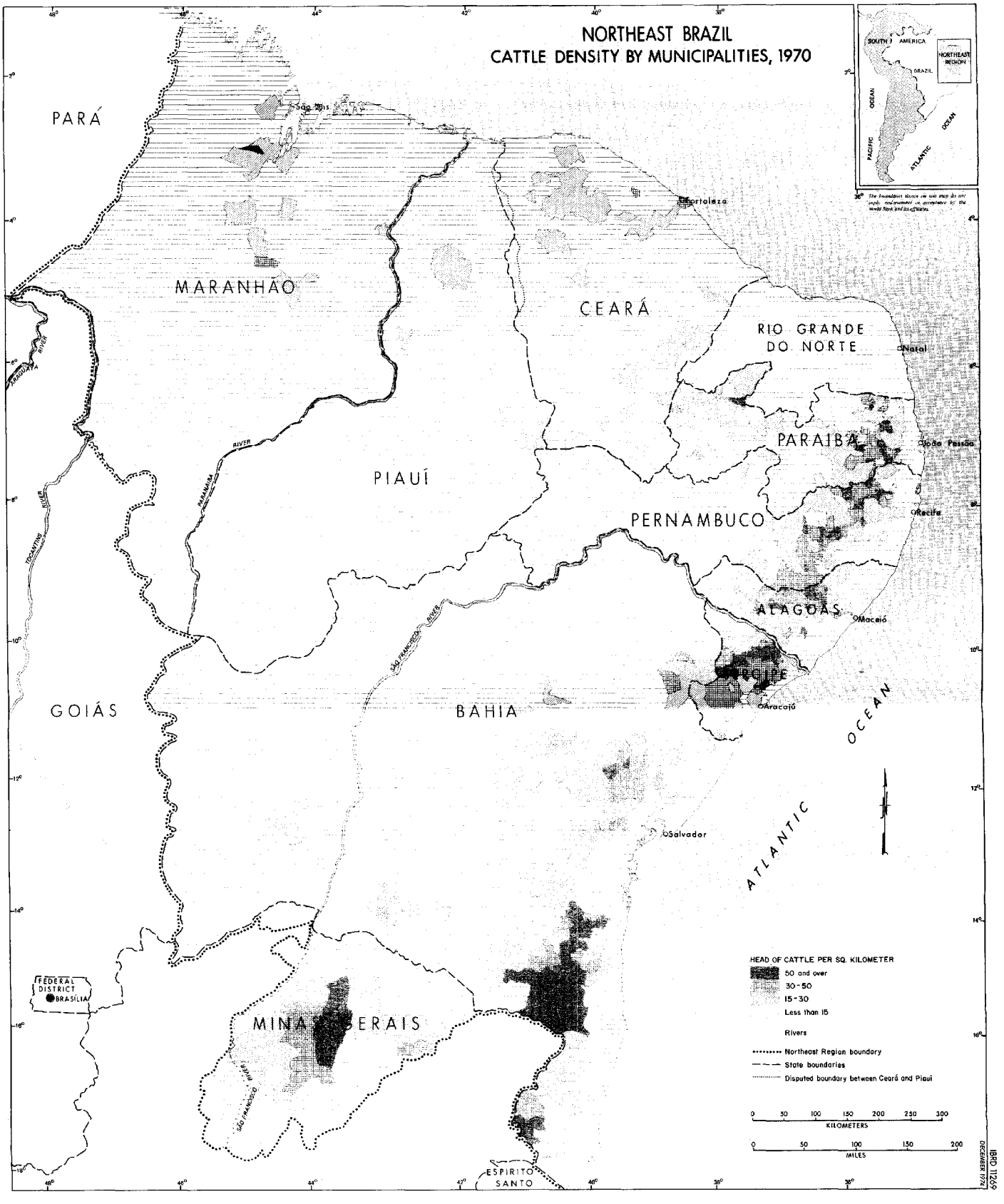
NORTHEAST BRAZIL
CATTLE DENSITY BY MUNICIPALITIES, 1970
PARÁ
MARANHÃO
CEARÁ
RIO GRANDE DO NORTE
PARAIBA
PIAUÍ
PERNAMBUCO
ALAGOAS
SERGIPE
GOIÁS
BAHIA
MINAS GERAIS
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FEDERAL DISTRICT
BRASILIA
Fortaleza
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ATLANTIC OCEAN
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NORTHEAST REGION
BRAZIL
PACIFIC OCEAN
ATLANTIC OCEAN
HEAD OF CATTLE PER SQ. KILOMETER
50 and over
30-50
15-30
Less than 15
Rivers
Northeast Region boundary
State boundaries
Disputed boundary between Ceará and Piaui
0 50 100 150 200 250 300
KILOMETERS
0 50 100 150 200
MILES
IBRD 11269
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ECONOMIC AND SOCIAL INDICATORS

	Northeast Brazil/a (1)	All Brazil/b (2)	(1):(2) %
ECONOMIC			
Net domestic product at factor cost 1970 (US$ millions equivalent)/c	4,182	35,981	11.6
Sectorial composition of NDP at fc,1970(%)/c			
Agriculture	33.4	14.6	.
Industry	11.6	32.7	.
Services	55.0	52.7	.
Per capita NDP at fc, 1970 (US$ equivalent)/c	149	386	38.6
Growth of GDP at fc (%)/d			
1966-70	6.8	7.5	90.7
1968	9.7	9.3	
1969	6.9	9.0	
1970	1.4	9.5	
1971	10.6	11.3	
DEMOGRAPHIC			
Total population (millions in 1970)/e	28.1	93.2	30.2
Average population growth rate, 1960-70/b			
Urban	4.6	5.2	
Rural	1.3	0.7	
Total	2.5	2.9	
Share of population that is/b			
Urban	41.8	56.0	
Rural	58.2	44.0	
Gross mortality rate, %, 1960-70/b	18.0	10.1	178.2
Gross birth rate, %, 1960-70/b	44.0	38.3	114.9
Infant mortality rate per 000 live births	137.4	75.1	183.0
Life expectancy at birth (years)	49.0	61.0	80.3
Age distribution of population in 1970 (%)/e			
0 - 14	45.3	42.0	
15 - 59	49.5	52.8	
60 and over	5.2	5.2	
Dependency ratio/1	1.02	0.89	
EMPLOYMENT			
Total labor force (millions in 1970)	8.2	29.5	27.8
Total persons employed in agriculture (millions in 1970)	5.2	13.1	39.7
Sector share of employment (% 1970)			
Industry	10.8	17.8	
Services	27.5	38.0	
Agriculture	61.7	44.2	
% underemployment in agriculture 1970/2	50.0	..	
% underemployment in urban sector/2	25.0	21.0	
Northeast agriculture work force as % of total Brazilian agricultural work force in 1970	39.7	.	
Wage earners as % of agricultural work force in 1970	25.0	..	
% of agricultural workers earning less than minimum wage/3	93.0	60.0	
% labor force in 1970 with some secondary school training	8.0	16.0	
Average education of labor force (years 1970	..	2.9	
Labor force as % of total Northeast population	29.0		
INCOME DISTRIBUTION/i			
% of monetary income received by			
richest 1%	17.6	14.1	
richest 5%	37.9	34.1	
poorest 40%	10.7	10.0	

	Northeast Brazil/a (1)	All Brazil/b (2)	(1):(2) %
LAND USE AND DISTRIBUTION			
Total land area (millions of km.^{2})	1.6	8.4	19.1
Area used for agricultural purposes (millions of hectares)	10.2	191.0	5.3
% male agricultural workers who are owner-operators	25.0	62.0/g	
Northeast land area planted in sugar (as % of total Brazil sugar area)/5	10.4	.	
Cattle per agricultural worker in 1970	2.8	4.3/g	
Farm size distribution in hectares (% of farms in 1970)/g			
under 10	68.4	51.4	
10 - 100	25.5	39.4	
100 - 1,000	5.7	8.4	
1,000 and over	0.4	0.8	
Farm size distribution in hectares (% of farm area in 1970)/g			
under 10	5.6	3.1	
10 - 100	24.2	20.5	
100 - 1,000	43.4	37.2	
1,000 and over	26.8	39.2	
EDUCATION			
Enrollment ratio, 1970 (% of primary age group)/6	45.0	70.0	26.9
Years of school provided (1st and 2nd levels)	11.0	13.0	
Illiteracy rate, 1970 (% of labor force)	54.8	29.7	184.5
Percentage of total illiterates in Brazil	50.0	.	
Percentage drop-out before Grade 4	81.0	64.0	126.6
Percentage of primary school graduates entering secondary school	50.0	..	
Percentage of primary schools having a single classroom	70.0	..	
Vocational enrollment as % of secondary school enrollment	23.0	..	
Enrollment in agriculture as % of total enrollment	1.0	1.0	
% GNP spent on education	..	3.3	
HOUSING			
Average number of persons per room (urban)	..	1.0	
% of occupied units without piped water (urban)	70.0	45.0	
% urban population served by sewerage	7.0	26.0	
% rural population served by sewerage	0.2	0.5	
% rural population served by water	0.6	2.4	
HEALTH AND NUTRITION			
Population per physician	4,357.0	1,950.0	223.4
Population per hospital bed	500.0	260.0	192.3
Per capita calorie supply as % of requirement	77.0	106.0	72.6
Per capita protein intake as % of daily requirement	75.0	63.0	119.1
CONSUMPTION			
Radio receivers per 1,000 population	..	60.0	
Passenger cars per 1,000 population/e	11.0	26.0	42.3
Electric power consumption per capita (kwh)	106.0	477.0	22.2
Newsprint consumption per capita kg./yr.	..	2.9	
Cement consumption per capita kg.	46.0	97.0	47.4
Per capita gasoline consumption (liters)	43.0	100.0	43.0
Total fertilizer usage (tons in 1969)/h	52,000.0	630,000.0/7	8.3
Fertilizer used per hectare (kg./ha.1969)/h	4.0	27.0/7	14.8
% fertilizer used on sugarcane/h	90.0	..	
% of all fertilizer used by states of Pernambuco, Alagoas, and Paraiba/h	97.0	.	
Tractors on farms (units)	6,177.0	157,346.0	3.9
Number of tractors per 100 farms	2.8	32.0	8.8
% farmers receiving technical assistance	4.0	10.0	40.0
% agricultural credit received by Northeast	11.0	.	
Agricultural credit as % of gross agricultural product	19.0	37.0	

/1 Ratio of "under 15" and "60 and over" labor force age brackets to those in bracket of ages 15 through 59.

/2 Work less than 40 hours per week.

/3 Minimum wage in 1970 was about US$25 equivalent per month.

/4 Data for the Northeast refers to the five states of Ceara, Rio Grande do Norte, Paraiba, Pernambuco and Alagoas.

/5 Total sugar producing area in Brazil was 1,725,000 hectares in 1970.

/6 Northeast enrollment accounts for 20% of total national enrollment.

/7 Excludes the Northeast.

Sources: /a Unless otherwise noted, data for the Northeast is from IBRD Report No. 38-BR, Vol. IV, "The Northeast Development Effort," March 1973.

/b Unless otherwise noted, data for all Brazil is from IBRD Report No. 38-BR, Vol. I, "The Main Report," March 1973.

/c From "Sistema de Contas Nacionais - Novas Estimativas," Fundacao Getulio Vargas, September 1974.

/d Growth rates for the Northeast from "Nordeste Brasil - Produto e Formacao Bruta de Capital, 1965-1971," SUDENE, 1973.

/e "Anuario Estatistico do Brasil: 1973," Fundacao IBGE, 1973.

/f "Plano Integrado Para o Combate Preventivo Aos Efeitos das Secas no Nordeste," Serie Desenvolvimento Regional No. 1, Ministerio do Interior, 1973.

/g "Sinopse Preliminar do Censo Agropecuario - VIII Recenseamento Geral - 1970," Fundacao IBGE, 1973.

/h "A Chemical Fertilizer Program for Northeast Brazil," SUDENE, 1970.

/i Carlos Geraldo Langoni, "Distribucao da Renda e Desenvolvimento Economico do Brasil," Editora Expressao e Cultura, 1973.

.. not available
. not applicable

CONCLUSIONS AND RECOMMENDATIONS

The Challenge of Northeast Rural Development

1. With a population of about 30 million inhabitants and a per capita income of less than US$200, the Northeast of Brazil contains the largest concentration of poverty in Latin America. Almost 60% of the population lives in rural areas, where agricultural yields are generally low and poverty is endemic, as the effects of unfavorable ecological conditions are compounded by land tenure problems. It has been suggested that, in view of the abundance of labor and scarcity of capital in the Northeast, the labor intensity of small farmer production and the very limited economies of scale exhibited by agriculture, rural development projects which make available to small farmers packages of inputs and services especially tailored to their needs, could increase productivity and improve the living conditions of large numbers of poor people in rural areas of the Northeast. This report deals with a number of the economic, social and institutional barriers to the design and/or execution of such projects. In addition, it covers a wide range of policy issues, both agricultural and industrial, which affect the provision of new income and employment opportunities to the poorest groups of Brazilian society in the Northeast. This report is intended to complement other ongoing Bank activities in the Northeast and is designed to improve the understanding of major policy issues and institutional changes required to design rural development projects which will raise living standards of the poor. The conclusions and recommendations presented below should not be viewed as self-contained or isolated prescriptions, but rather should be taken as interrelated components of a comprehensive program for rural development and employment creation in the Northeast.

2. The agricultural policies of the Government of Brazil have multiple objectives: they are designed to stimulate output to meet the increasing demand of the population for food and fibers; they are intended to encourage production for export to make a substantial contribution to foreign exchange earnings; and, they are seen as instruments for raising income levels of the rural poor. The Government is increasingly realizing that it has, in the past, given too little emphasis to the last goal. This is because, while most officials have been and are deeply concerned about the low incomes of the rural poor in he Northeast, they have in the past generally felt that the best way of relieving this problem was through expanding socially oriented programs in the fields of education, health, nutrition, sanitation and broadening the application of social security and labor legislation rather than through production oriented programs aimed at low-income groups.

3. The emphasis of governmental programs is beginning to shift somewhat, as evidenced by the formulation of POLONORDESTE which is designed, inter alia, to raise the productivity and incomes of small farmers through integrated rural development projects. It should be recognized that large-scale programs to

improve productivity of small farmers will be demanding in terms of allocation of government staff and institutional facilities, will require complex administrative arrangements, will have a long maturation period because of the time required to train and upgrade managerial capacity of farm operators and will carry a certain amount of risk in terms of the probabilities of achieving expected benefits.

Beneficiaries of Rural Development Programs

4. Land ownership in the Northeast is highly concentrated in a relatively small number of large estates, while a small portion of the total land area is atomized into a great number of very small farms. Establishments with less than ten hectares, which are regarded as minifundia in practically all of the Northeast, represent almost 70% of the total number of establishments but control less than 6% of the total area. The very unequal distribution of landholdings does not exaggerate the inequality in distribution of capital and wealth. In fact, analysis which takes account of differences in soil fertility and in the stock of fixed capital shows that the distribution of wealth incorporated into land is even more unevenly distributed than land itself. The distribution of income among landowners appears to be as unequal as the distribution of land itself.

5. As serious as is the plight of the very small landowner in the Northeast, the most severe poverty problems are found among the more than 80% of the rural labor force which does not own land. This group makes up the great majority of the very bottom of the Brazilian income distribution. This landless population is employed in various forms of tenancy and wage labor, of which the largest subgroups are the sharecroppers and the temporary laborers. These jointly account for half of the economically active population in agriculture. The development potential of this group is limited by a whole range of deepseated formal and informal practices which regulate the right and obligations of owners, tenants and laborers.

6. Less than 40% of the agricultural land of the Northeast is exploited directly by owner-operators. Sharecroppers, the most common form of tenant, cultivate over one-fourth of the agricultural land, under more or less precarious forms of tenure. The fact that farmers do not own or fully control the land they live on and may be subject to expulsion from it, greatly restricts the range of measures that can be used to increase their productivity. While, on equity grounds, rural development programs should probably be aimed at the landless population and the very small landowners, since these groups constitute the core of the rural poverty problem in the Northeast, the greatest potential for improvement of production lies in the group of small- and medium-landowners and the sharecroppers with more secure tenancy, which already have some degree of access to and control over use of land.

7. The trend in the region has been for tenancy arrangements to become less secure and for the proportion of landless laborers in rural areas to grow. Traditional landlords, which employ the largest proportion of sharecroppers, are gradually evolving into more market-oriented commercially motivated farmers. Increasing profit motivation and adoption of more modern techniques tends to weaken the paternalistic link between landlord and sharecropper. Tenancy becomes less secure and the distribution of output between landlord and sharecropper becomes less equitable. Further commercialization and modernization of agriculture is likely to result in an accelerated eviction of sharecroppers and their transformation into wage laborers who now tend to have lower levels of real income. While the tendency to transform tenants into wage laborers is probably inevitable and is likely to be accelerated with technological progress, rural development projects should attempt to introduce tenancy contracts which increase security of tenure. Forms of cost-sharing, long-term tenancy agreements and fixed-rent agreements could be introduced as part of rural development projects depending on the existing form of tenancy and the structure of the project. However, complications involved in enforcement may be overwhelming and could well result in bogging down of efforts to strengthen delivery of technical improvements. In many areas of the Northeast, the policy most likely to both increase agricultural production and improve rural income distribution is the spreading of direct control of productive land over a wider range of the population, by facilitating subdivision of the underutilized land on large estates and providing administrative and technical assistance.

Possibilities for Land Redistribution

8. A selective and well-designed program of redistribution of land from large estates in the Northeast into a family farm sector would tend to raise agricultural output since it would involve an increase in the use of un- and underutilized land and a more intensive use of currently underemployed labor. Land redistribution is particularly important in the Zona da Mata which, in spite of having the best land in the Northeast, employs relatively less labor than the rest of the region. This zone represents one-third of the total land value of the five states in which it falls, yet it absorbs only one-fifth of the agricultural labor force in these states.

9. The Government's PROTERRA land redistribution program in the Zona da Mata started very slowly. Only 17,000 hectares have been expropriated since 1972 and less than half of this area has been transferred to recipient families. The major obstacles to the implementation of the PROTERRA land reform program have been the limited official and institutional support that INCRA, the land reform agency, has received in the enforcement of land transfers under the agrarian reform legislation, the understaffing of the agency and its consequent lack of technical capacity to select beneficiaries and design and implement programs for the land to be transferred. While the scope of future land redistribution has not yet been determined, the President of INCRA has recently stated that, in addition to almost 600,000 hectares already placed at the disposition of the agency by adhering landowners, an additional 800,000 hectares could be

expropriated from landholders who have failed to do so. If the entire area were placed into family parcels, this would abosrb about 88,000 families. This would represent 220,000 workers or approximately 5.7% of the agricultural labor force of the six core Northeastern states. A land reform of these dimensions would clearly be a significant beginning in transforming the agrarian structure.

10. Even more, a limited program would be preferable to a total paralysis of the land redistribution effort in the Northeast. The program should probably continue to concentrate on the Zona da Mata where prospects for success are much better than elsewhere in the Northeast, since ecological conditions are more favorable and there is an existing and fairly well accepted mechanism for land redistribution available. Accomplishments under this limited program could help dispel the prejudice that land reform creates a stagnant small-farm structure. Continued existence of the program would also serve as an element of pressure on landlords to utilize their available land more fully and could even eventually lead to future extension of land reform to areas presently exempt under existing regulations. International agencies and the Government might examine the possibilities for providing technical and financial assistance to strengthen the administrative organization of the land reform agency, for constructing of infrastructure in reform areas, and for financing purchase of inputs and provision of other services required by the beneficiaries of the program within the context of integrated rural development projects.

11. A credit program for land purchase by small farmers and tenants might be an acceptable second best alternative to more traditional and direct forms of land reform. The PROTERRA Land Purchase Credit Program of the Bank of Brazil which has stimulated a significant amount of land redistribution through the market mechanism could provide the basis for an expanded scheme. The program has financed the acquisition, in some cases by tenants and sharecroppers, of 303,000 hectares in the three years of its existence. It is not, however, looked upon favorably by its financial agents, because the rate of arrears has been high and Bank of Brazil branches feel that the administration of the program absorbs a disproportionate part of their technical staff. The underlying reason for the high arrears has been that loan terms, in particular the requirement of a cash down payment of 20% of the price of the land, which often is borrowed from noninstitutional credit sources on very onerous terms, are too hard for sharecroppers and tenants trying to buy the land they work. Existence of this financing scheme does not appear to have provoked a disproportionate increase in land prices. In spite of the relatively large amounts of land sold under the program, the data on trends in land prices do not indicate an unusual increase during the period of the program in those areas where there have been the largest number of transactions.

12. The main disadvantage of a land purchase credit scheme as a substitute for land reform is that, even if the terms are soft, relatively few landless families have the knowledge or resources or are in a bargaining position to undertake this type of operation on their own. In addition, market purchases tend to take place in an unplanned and scattered fashion which

complicates the task of provision of infrastructure and complementary services needed to make the new small landowners' operations economically viable. Thus, a land purchase credit scheme, unless conceived as a component of an integrated rural development program, would be less desirable than a well coordinated and institutionally strong land reform program. Despite its shortcomings however, a land credit facility could be an important component of an integrated rural development programs, particularly where there are severe land tenure problems and where land reform cannot be implemented in the near term. Such a credit facility should be viewed as a complement to rather than a substitute for the INCRA-PROTERRA land reform program. The problems of the present land credit program could be dealt with relatively easily and at minor cost by softening loan terms -- particularly down payment requirements. In the absence of rural development programs, the prospects for success of small farmers could be enhanced by adding to the credit scheme a component of compulsory technical assistance and financing for required inputs.

13. Land taxation is often mentioned as a mechanism for bringing about an improvement in land distribution and agricultural productivity. The main problems with the existing land tax in the Northeast are that the land value declared tends to be significantly below market value, the rate of land price increase is such that land value declared is quickly outdated, and the basic tax rates themselves are low. The land tax burden amounted in 1973 to less than 0.6% of the average aggregate land value. Such a tax burden appears totally inadequate to influence decisions concerning land use and land sale, particularly since with the current very high rate of appreciation of land values, capital gains from asset holding largely offset any effect the tax might have had on production decisions.

14. The effect of the land tax in the Northeast on land distribution and agricultural productivity could be strengthened by adjusting land values during the intercadastral period by an index of actual market values of land. Such an index is already maintained by the Getulio Vargas Foundation. Since it is estimated that at present, only about 70% of tax due is collected improved administration of the tax would increase its efficacy. Despite the desirability of such reforms in the land tax, these revisions would probably not make the land tax an adequate substitute for agrarian reform in bringing about significant improvements in land distribution and tenure. It would probably be just as easy to enforce a selective land reform in the Northeast as to increase the effective land tax rate by an amount sufficient to have significant influence on land use.

Availability of Agricultural Technology

15. There are virtually no agricultural research and demonstration results which are relevant to the needs of small farmers in the Northeast. Most crop research on varieties, planting dates, fertilizer applications, etc., has been experimental and there has been little concurrent testing under actual small-farm operating conditions. The transferability of

existing technological packages to farmers is limited by the fact that the technical assistance agencies have not demonstrated their impact on farm budgets. Their work programs are oriented to physical production, primarily in terms of technical factors; that is, correct soil preparation, correct planting practices, use of fertilizer, etc. While this is a necessary prerequisite to improving yields and productivity, it does not show the profitability of the recommended practices or their effect on net farm income from all operations, which are of primary interest to the farmer. An evaluation of the technological packages currently most often recommended indicates that, for the products usually cultivated in the semiarid zones of the Northeast, given factor-product price relationships, they are not sufficiently attractive in terms of profitability or reduced risk to encourage most farmers, regardless of size, to adopt them. This is especially true of sharecroppers and small farmers living close to subsistence levels whose production is vulnerable to climatic variations and who are unwilling to assume the additional risks involved in incurring debt to finance higher outlays associated with new technology.

16. A basic reorientation of agricultural research and technical assistance aimed at small farmers should be considered. The focus should be on simple, labor-intensive technical packages such as push or animal-drawn cultivators, low-cost soil and water conservation practices and drought resistant improved seeds, which can increase output and/or reduce risks with only marginal increases in investments and annual operating costs. Only when these practices are proven adaptable to specific locations and farmers become convinced of their profitability, will there be sufficient incentive and interest on the part of farmers to abandon their present technological practices and participate voluntarily on programs to increase productivity.

Transfer of Agricultural Technology

17. The effectiveness of the rural extension system in the Northeast has been limited by lack of coordination of its work with other public and private entities engaged in agricultural technical assistance activities, lack of long-term objectives and planning, and its protracted financial instability. While some coordination and control mechanisms have been instituted within each of the numerous entities providing technical assistance to agriculture, the lack of an overall coordinating authority has prevented the generation of economies of scale in the execution of technical assistance programs, increasing the cost of providing technical assistance and leading to a misallocation of the scarce human resources available for this activity. The flow of federal funds to the ANCARes (the Northeast affiliates of the Rural Extension System) has been very irregular. The lack of an effective control and evaluation mechanism at the federal level to assess the results of federal expenditures on extension, has resulted in repeated delays and a general reluctance of federal authorities to make budgetary allocations for extension activities. The irregular flow of funds has in turn led the ANCARes to seek other sources of financing, and has led to a dispersing of their efforts, a reduction of their planning horizon and has limited their effectiveness as an instrument for spreading productivity-increasing practices in agriculture.

18. The Government is taking steps to strengthen both the research and the extension service and has created federal enterprises (EMBRAPA and EMBRATER) to assume nationwide control and coordination of these activities. Creation of this additional administrative superstructure reflects the Government's determination to make research and extension more effective and production oriented. Special attention should be given to coordination at the farm level to assure that additional technical and financial resources are channeled into programs for small farmers. Developing and reaching agreements on common objectives for technical assistance and other services can probably be achieved at the federal level. The most difficult task, however, will be linking and coordinating technical assistance services, agricultural research, marketing activities and institutions, credit, and education and training programs at the farm level. For the immediate future, this critical coordination can probably be achieved only in selected areas and within the context of integrated rural development projects. Over the longer term, the restructuring and strengthening of the extension service will require considerable technical and financial resources for training of staff, as well as for equipment and physical facilities. The Government might wish to consider the possibility of obtaining some technical and financial support from international development institutions for this effort.

19. The effectiveness of agricultural extension depends fundamentally on the availability of technological packages appropriate to the risk-averting behavior of small farmers. It will therefore be necessary to put much more research effort into development of production techniques which are economic in the small-farm environment of the Northeast. This will require much closer cooperation between the research and extension entities than in the past. While higher productivity inputs and techniques are being devised and proven profitable, efforts should be made to identify existing cultivation practices currently being used by more successful small farmers, which moderately increase yields and net incomes while reducing the risk of climatic loss.

20. Under present interagency arrangements in the Northeast, coordination exists at the federal and sometimes at the state level, but in most cases programs reach the farmers through separate, autonomous agency channels. The need for interagency coordination is particularly critical at the project level. Rural development projects should be structured so that the project director has full administrative control over the project staff contributed by participating agencies, thus assuring that the work of interdisciplinary teams at the project level is properly coordinated. Responsibility for technical matters could still be retained by the specialized agencies. Organizing projects along these lines would allow the project director the flexibility to deploy his staff as he sees the requirements and to respond relatively quickly to contingencies or problems unforeseen during project preparation. Giving responsibility for project administration to a single agency which in turn contracts services of other agencies for particular tasks, the current practice for projects in the Northeast, gives the administering agency less flexibility and thus makes it less effective in dealing with the complex, interdisciplinary issues which often emerge in rural development projects.

21. Small farmers in the Northeast are numerous and geographically dispersed and the staff available for technical assistance in the foreseeable future will be far too small to reach a significant number on an individual basis. However, the impact of an individual extension worker could be multiplied through the use of farmers and of farmer organizations in the dissemination of agricultural information. The few existing small farmer organizations in the Northeast, however, are weak and do not have sufficient government encouragement or support. The organization of farmers is greatly complicated by the diversity and instability of land tenure arrangements. Without some type of farmer organization, the cost of implementing successful rural development projects would be excessive, not only in terms of the requirements of technical assistance, but also in terms of the provision of marketing services and infrastructure. In view of the limited tradition of community involvement and the absence of small farmer local groups or organizations in the region, the promotion of informal associations of small landowners and sharecroppers and the provision of some services to these groups might be warranted. Such informal associations could eventually grow into cooperatives as small farmers acquire more experience and self-confidence. These organizations should probably begin with small landowners (minifundia owners). Once well established, sharecroppers could be incorporated into these associations gradually in order to avoid an initial confrontation with landlords which might oppose such programs.

Small-Farmer Credit

22. Although the availability of subsidized agricultural credit in the Northeast has increased rapidly, apparently very little has gone to small farmers. The limited access to credit of small-farm operators who do not have land titles or who own plots of less than ten hectares constitutes a significant impediment to their rise out of poverty. These farmers make up almost two-thirds of the agricultural labor force and are generally not regarded as creditworthy by institutional credit agents. The goal of the PROTERRA program, which started in 1972, was to accelerate Northeastern rural development through a massive infusion of heavily subsidized credit. This, it was thought, would stimulate investment, utilization of modern inputs and transfer of land. Although PROTERRA credit policy gave no special emphasis to investment in the livestock industry, this type of investment eventually came to dominate the program. The availability of funds at low nominal interest rates in an inflationary environment made purchase of land and building up of investment in livestock herds a very attractive form of asset holding. In addition, the financing of cattle is particularly attractive to financial institutions in the Northeast. If the borrower defaults, collection and sale of the asset is easier than in the case of mortgaged crops or even mortgaged land. Little of the credit provided under the program went to small landowners or small farmers without title to the land they work. As a result, PROTERRA has led to a redistribution of the use of credit toward asset-concentrating activities rather than to modernization of Northeast agriculture.

23. Experience has shown that credit programs which are not channelled through institutions which will assure that an adequate share reaches small farmers will inevitably be dominated by large farmers. In order to assure a broader distribution of credit to small farms either new institutional arrangements involving specialized credit agencies or separate units within the Bank of Brazil or the Bank of the Northeast will have to be devised, or an indirect approach may have to be developed. In the absence of programs and institutions oriented to small farmers in the Northeast which could channel resources primarily to farmers, indirect approaches may be necessary to avoid resources being preempted by larger producers. For example, rural development projects might emphasize crops like beans, corn and manioc, in which large farmers have little interest, counting on the structure of production rather than administrative regulations and government commitment to keep larger farmers from preempting credit and other services provided by such projects. Making financing for cattle available to small farmers in the Northeast on a larger scale would fit into banking institutions' natural bias toward livestock financing, and at the same time would avoid the asset-concentration effects of that bias. It would permit some form of relatively liquid asset holding for poor farmers in an environment where possibilities of saving are very limited, and it would provide easier access to financing for landless farmers. Dairy cattle might be particularly suited for small-scale agriculture in the Northeast. Providing crop insurance and diversifying small-farmer loans by financing cattle are two ways of diminishing the institutional aversion to lending to these farmers caused by uncertain climatic conditions. In addition, some combinations of crops and planting and cultivation practices could result in a less vulnerable pattern of agricultural production than provided by current practices. This might ultimately reduce the reluctance of banking institutions to lend to small farmers, as well as the farmer's aversion to acquiring debt.

24. Providing financing and other services to smaller farmers through cooperatives has been advanced by government agencies or financial intermediaries as a way of improving their access to these services. This formal support has not, however, been accompanied by a financial commitment. There are some instances of cooperatives in the Northeast which have achieved certain success, in particular, the cotton cooperatives of Ceara and Rio Grande do Norte. An analysis of the origin and characteristics of these cooperatives indicates that the institutional form of an organization is less important to its viability than is the pattern of production, marketing and processing of the crop involved. More important, it points up the critical requirement of active and creative support from a powerful governmental agency. If cooperatives are to be an effective way of reaching small farmers, more needs to be known about the Northeast cooperatives that have worked well so that preconditions for success in other crops and areas can be identified.

25. The Bank of Brazil, which accounts for 80% of institutional rural credit in the Northeast, is the only public institution in the region with substantial experience with small farmers and has gradually introduced lending concepts and procedures favoring this group. In addition, the geographi-

cal dispersion of its branch agencies makes it a particularly apt vehicle for channeling credit for small farmers. Despite their experience with small-farmer credit, Bank of Brazil officials tend to look upon such credit as serving mainly distributive ends, and there is little interest in its production- or productivity-increasing potential. As a result, there is a lack of technical assistance to or cooperation with extension agencies in the administration of small-farm credit; an absence of interest in, and therefore data on, small-farmer production response patterns to changes in credit supply; and a lack of guidelines on specific crops suitable for small-farm agriculture.

26. Despite the limited nature of the Bank of Brazil's involvement with small farmers, it would probably be the best institution to undertake such a program. Channeling a small-farmer credit program through the Bank of Brazil would take advantage of its standing and power in the Northeast economy. The Bank of Brazil has shown independence and could resist the opposition of large farmers to its activities benefiting smaller producers or sharecroppers. The Bank of Brazil could endorse a policy of financing long cycle crops for those small farmers who were capable of producing and marketing them. It could introduce a policy of disbursing its small-farm credit in accordance to the planting season rather than, as is presently the practice, waiting for the rains to reduce its risk, much more easily than a smaller, less profitable financial institution. An extra credit ceiling for a small-farmer program, and a Central Bank interest subsidy in PROTERRA style to make small farmer lending yield a return at least comparable to that in larger operations, might be sufficient incentive for the Bank of Brazil to support such a program.

27. While these probably is a case for subsidization of the agricultural sector to offset the bias in favor of industry explicit in moving government policies, from a resource allocation point of view, there may be more efficient ways of accomplishing this than through subsidized interest rates. A government subsidy to a crop insurance scheme might be a more desirable policy alternative than expanding the present scheme or interest - subsidized credit to smaller farmers. Crop insurance could reduce the risk to financial institutions of lending to small farmers and at the same time help overcome the farmers' risk-averting behavior and increase their receptivity to new crops and new production techniques. In addition, the Government might consider payments to financial intermediaries to compensate them for the higher per unit costs involved in processing and administering small loans. These two initiatives could increase the flow of institutional credit to small farmers, thus reducing their dependence on noninstitutional financial intermediaries and improving their access to the markets for their inputs and crops. However, if the Government continues to feel that it must subsidize northeastern agriculture through the interest rate structure, the least it could do would be to make these subsidies available to model farmers as well.

28. Since productivity increasing packages that are financially attractive to labor-intensive small farmers in the Northeast have neither been developed nor disseminated on a sufficiently large scale, linking small-farmer credit

directly to purchase of fertilizer, pesticides, seeds, etc., may not be possible, or may severely limit the scope for application of such credit. The main purpose of agricultural credit is usually to finance increases in investment and working capital for productive inputs. However, in the case of small farmers, the major input is his own labor, and financing this input necessarily implies financing consumption to carry him from one harvest to the next. Since most institutional credit available is tied to the purchase of "modern" inputs, this virtually rules out small farmers' access to such credit. The availability of credit, in and of itself, can make a significant contribution to improving the economic well-being of small farmers by reducing their dependency on noninstitutional credit intermediaries and giving them access to better market prices for their products. This benefit might even exceed those from productivity gains that could be expected from a change in techniques, given the limited availability of proven technological packages. Ideally, such credit should be made available within the context of integrated rural development projects in which, through the provision of other services, significant increases in production could be attained as well. While POLONORDESTE is an encouraging step forward, it will have relatively limited coverage. The Government might therefore, consider establishing in addition a substantial line of small-farmer credit in the Northeast, with eligibility limited to plot size and annual incomes below certain ceilings to prevent diversion of the funds to larger users. This would increase the viability of small-scale agriculture and the competitiveness of small farmers. In addition, it would tend to increase productive efficiency by reducing the bias towards capital-intensive agricultural technologies in the Northeast. It could be argued that if subsidies are to be given at all, they would be more justifiable in the case of small farmers since they would tend to offset their higher vulnerability to climatic failure and their consequent risk averting behavior. Finally, subsidizing small farmers could have the effect of reducing rural urban migration. The cost of such a subsidy would have to be weighed against the alternative costs involved in increased urban infrastructure and social services needed to accommodate these migrants.

Industrialization, Employment and Northeast Development

29. The Government has been attempting to increase urban employment opportunities in the Northeast by promoting the industrial development of the region. The main instrument for stimulating industrialization in the Northeast has been the channeling of substantial fiscal resources into the region through an investment tax incentive scheme known as Article 34/18 Program. The scheme was introduced in 1961 and permits registered Brazilian corporations to reduce their annual federal income tax liabilities by investing in projects approved by SUDENE, the Northeast development agency. These incentives have been reinforced by a series of more conventional measures including low-cost term and working capital financing, and full or partial exemption from corporate income tax, tariffs, import duties and value-added tax. However, while there are a wide range of incentives for capital use, there are no measures which operate directly to reduce the private opportunity cost of labor. The marked factor bias of

this official incentive system contrasts rather sharply with the severe underemployment and concentrated income distribution which characterize the Northeastern economy.

30. The investment subsidy conferred by the 34/18 incentives imparts a general bias toward capital intensity both in choice of technique and choice of product to be produced. The effect of this is particularly striking in the case of approved agricultural projects, which show a capital-labor ratio significantly above the estimated range of US$15,000 to US$20,000 for 34/18 projects in manufacturing. As a result of the capital bias, employment generation has been small. Extraordinarily high indirect employment effects must be assumed to sustain the view that the 34/18 scheme is reducing the incidence of urban underemployment in the region. Nevertheless, it can be reasonably claimed that it has prevented a pronounced aggravation of this situation.

31. The main issues emerging from 34/18 project financing relate to the growing disequilibrium between supply and demand for funds, the weakness of official financial intermediation and the limited incentives for labor absorption. As a result of the diversion of 50% of regional tax credit funds to the PIN and PROTERRA programs in 1970/71, 34/18 deposit flows in real terms have declined significantly. In the past, beneficiary firms sponsoring projects were responsible for securing their approved allocation of 34/18 funds and private investors with uncommitted tax credit deposits could choose freely between these projects. As a result, projects selected by SUDENE as having high priority for regional development were not guaranteed the access to 34/18 financing. These circumstances tended to militate against smaller firms, particularly Northeastern firms, due to the concentration of 34/18 deposits in the Center-South, and result in organizers being unable to secure funds to carry out implementation schedules.

32. In December 1974, the Government enacted new legislation to centralize application of 34/18 deposits to correct this situation. These funds will now accrue to a new regional investment fund, the Fundo de Investimentos do Nordeste (FINOR), which will then allocate them among alternative projects. The 34/18 depositors would receive investment units in the Fund. Neither the depositors nor the Fund will intervene in the management of the companies receiveing the 34/18 deposits.

33. Two sets of measures could significantly stimulate labor absorption and improve the income distribution effect of 34/18 projects. First, the additional differential discrimination in favor of capital and intermediate goods industries could be eliminated from the points system for project evaluation. Insofar as higher capital-output ratio characterize these industries in the Northeast, they already obtain important incentives from the general subsidy to investment financing. This would tend to modify the industry mix of 34/18 investment in favor of consumer goods sectors and so accelerate employment creation as well as the use of local raw materials. Of course, investment in selected branches of intermediate and capital goals industries may be consistent

with regional comparative advantage. Such subsectors should be incorporated in a selective industrialization policy which seeks to promote an efficient industrial structure. Post policy has fostered an indiscriminate import substitution in an attempt to duplicate the industrial structure of the Center-South. Second, some direct incentives might be instituted to encourage labor use, either by subsidizing labor cost directly (for example by paying some proportion of the social security charges presently paid by employers) or by having the Government absorb training and qualification costs of firms.

34. Small- and medium-size industries in the Northeast account for a significant proportion of industrial employment, output and value added. These firms are, however, relatively neglected by public and private institutions in comparison to large enterprises. Generally, they appear as riskier and less attractive investments to holders of 34/18 credits, and face harder terms from private lenders or have difficulty in obtaining local bank guarantees since they lack sufficient assets to pledge. The problem is likely to be more acute in the future, as large firms which up to now have depended heavily on foreign financial credits are likely to turn to domestic sources on financing, competing advantageously with smaller firms as such credits become more scarce.

35. The main program providing official institutional framework for small and medium industries in the Northeast is the BNDE Program for Financing Small- and Medium-Size Firms. The BNB/SUDENE Small-and Medium-Size Industries Program also provides financing to small and medium industries but in a much more limited amount. The Industrial Assistance Centers (NAI) are used by both BNDE and BNB to provide technical assistance to small firms. The two programs for financing small- and medium-size firms have gradually become more similar. Although the BNB program tends to concentrate on smaller and more labor-intensive firms, both BNDE and BNB use the same intermediaries (the state development banks) and have similarly high and rigid collateral requirements (from 1.4 to 1.7 times the value of the financing requested). BNDE provides funds at positive interest rates, since its nominal rates are corrected by the ORTN index, while BNB's interest rates are fixed and have, therefore, been substantially subsidized. Both programs have as an objective the strengthening of the administrative and project evaluation capacity of the state development banks.

36. As a result of this parallelism, some competition between these two programs has developed. In particular, in March 1973, the BNB small-industry program trebled the size of eligible firms, more than trebled the individual loan ceiling, doubled the maximum loan term, and increased the size of the credit onlent to the state development banks, although the BNB ceiling for eligibility (fixed asset value of less than Cr$11.3 million in 1974) is still well below th BNDE maximum of Cr$38 million in fixed assets. The spread on its credit lines exceed those of the BNDE scheme. Final borrowers also incur lower financial charges under the BNB program. The Government should monitor this situation to assure that competition does not result in a weakening of creditworthiness standards or appraisal criteria of the institutions which, over the longer term would be detrimental to them and to the small- and medium-industry sector as well.

37. The main obstacles to improving the development orientation of small- and medium-industry programs are the rigidity of collateral requirements, the duplication and competition of programs and the weak developmental orientation of the state development banks. A relaxation of collateral requirements would reduce discrimination against smaller firms. A related but more indirect approach would be to form a collateral fund which would furnish acceptable loan security to bridge the gap between the real assets available to the firm and official collateral requirements. The official programs of industrial term financing should be unified and should probably be placed under the aegis of a single development banking system consisting of the BNDE, the Regional Development Banks, and the State Development Banks. Multilateral lenders should support initiatives to strengthen and unify this system and enhance its development orientation. Strengthening the state development banks would require an improvement of their project appraisal capacity and a reduction of the conflict between commercial and developmental objectives. This could be achieved by the BNDE assuming a substantial equity participation in the state development banks and appointing one or more directors to supervise the use of its credit line resources. Competitive salary scales and well-defined career structure should be established for the state development banks, the NAIs and other institutions in the development banking system to raise their operational capacity and achieve greater continuity in administration.

38. The Government announced the creation of an agro-industrial program for the Northeast in mid-1974. Agro-industries can be an efficient channel for providing small-scale farmers with technical assistance, improved inputs and financing, as well as a market outlet for increased output. The new program does not, however, have as an overriding objective raising the productivity of small farmers. Detailed implementation procedures, still under preparation, should explicitly recognize specific backward linkages with small producers and projects having positive effects on the productivity and income of small farmers should be given high priority.

39. Even if Agro-Industries Development Program involves the financing of large-scale, integrated plantation and processing operations, such projects would have several positive features. They would, inter alia, be consistent with production objectives and their direct employment effects may be significant. The locational aspect also should be emphasized, since the program's effects will be felt in he most backward sector in the poorest region of Brazil. However, credit channeled to wholly integrated plantation-processing enterprises is unlikely to reach small producers, whether owner-operators of sharecroppers, nor will fully integrated projects stimulate output growth on small farms via backward linkages. The efficiency and employment objectives of the program could probably be attained equally well by agro-industry projects which rely on independent small farmers rather than their own plantations for a significant proportion of their raw material supplies. The contribution of the new program to equity objectives will depend considerably on its success in articulating these linkages.

I. THE CHALLENGE OF NORTHEAST RURAL DEVELOPMENT

Background

1. In his address to the Board of Governors in Nairobi in September 1973, the President of the World Bank set forth the major goals of the Bank's Second Five-Year Program (FY74-78). He indicated that one of the major development issues confronting the Bank was that, in spite of the significant achievements in promoting economic growth in member countries during the previous five-year period, the benefits of this growth were not being equitably distributed. Because of this, it was suggested that the Bank would have to give "far greater emphasis on assistance designed to increase the productivity of that approximately 40% of the population of our developing member countries who have neither been able to contribute significantly to national economic growth nor to share equitably in economic progress."

2. While urban poverty problems are quite serious in most developing countries, the vast majority of low-income families live in rural areas. Thus, the President of the Bank also proposed that an important objective of the Bank program for FY74-78 should be to significantly improve productivity and living conditions of small-scale farmers. To that end, he proposed that the Bank "give particular attention in its economic advice to governments to those sectorial and financial policies which most affect the rural poor so that the resources to be invested by governments will have a maximum impact." He recommended further that the Bank direct a significant proportion of its expanded agricultural lending to projects which contain a component for small farmers. These goals were reaffirmed in the annual meeting in September 1974. In line with these objectives, the Bank staff has intensified its rural development activities in Brazil, concentrating its efforts in the Northeast region, the least developed and poorest region of the country.

3. With a population of about 30 million inhabitants and an average per capita income of less than US$200, the Northeast of Brazil contains the largest concentration of poverty in Latin America. Almost 60% of the population lives in rural areas. Agricultural yields in the region are generally low as the effects of poor ecological conditions -- semiarid weather and scarcity of fertile lands -- are compounded by problems emerging from concentration of land ownership and associated sharecropping and renting arrangements. Important bottlenecks to agricultural development, such as inadequate research, insufficient technical assistance, poorly developed marketing channels, primitive production techniques, uneconomic allocation of credit, insufficient economic and social infrastructure and weak public institutions have persisted despite considerable efforts to alleviate them.

4. There is a long history of deep concern in Brazil about regional income disparities and about the extent and degree of poverty in the Northeast. Various governments have introduced programs attempting to alleviate this situation. These programs, including the reservoir construction scheme, the

34/18 tax incentive program, the sugar rehabilitation plan, Amazon colonization and irrigation programs, have been analyzed in previous Bank reports. These programs have not significantly reduced the incidence of poverty in the region nor have they lessened regional income disparities. While to some extent this can be attributed to the poor natural resource base and weak institutional support from the federal government, the fact is that the development of functional programs such as research and extension, subsidized credit, improved inputs, and transport and marketing infrastructure has not taken full cognizance of two important factors which influence their effectiveness in raising productivity of a particular group of farmers.

5. First, productive inputs and services are highly complementary. All the necessary inputs and services have to be present simultaneously and in appropriate proportions, since the overall strength of the program is limited by its weakest component, no matter how effective the other elements might be. Thus, for example, the impact of a yield-increasing technology will be small if it does not reach the farmer for lack of adequately trained and motivated technical assistance agents; or if the inputs recommended are not available in sufficient quantities in the right place and at the right time; or if the farmer does not control sufficient land to generate a significant increase in his disposable income by applying the new technology; or if he cannot find appropriate marketing channels to sell his product; or if his expected profits are preempted by oligopsonistic middlemen; or if prices of inputs and products do not provide sufficient incentive for him to incur the additional work and risk of using higher yielding techniques. In general, larger agricultural producers have had much greater access to a reasonable combination of these productive services than small-scale farmers.

6. Second, productive inputs and services are specific to a particular target group of farmers. Small farmers tend to face economic, social, institutional and political conditions which are generally different from those facing large producers. Furthermore, these conditions vary from one state to another, or from one of the various subregions of the Northeast to another. Thus, to be effective, the various production factors and services have to be adapted to these specific conditions. For example, technical assistance to small farmers must be delivered by extension agents who are thoroughly familiar with the traditional production techniques of these farmers and with the ecological and economic conditions of their particular locality. Research must be carried out locally and with crops already known to the farmers, and the results must be adapted to the particular resource endowment of the target group. In particular areas, improvement in the man-land ratio through colonization and land redistribution and the elimination of precarious systems of land tenure might be a precondition to the effectiveness of any program for assisting small farmers, while it might not be necessary in other areas or with other groups of farmers. Credit channels and administrative arrangements for delivering credit to small farmers have to operate differently, and might even have to be administered separately from those serving large farmers. The marketing channels and the system of prices affecting small farmers are generally distorted by monopolistic characteristics and require stronger government policies than those required by more commercially integrated farmers.

7. All this implies that raising the productivity of large numbers of small farmers will require development of a package of inputs and services especially tailored to the needs of the target group and of effective institutional arrangements to ensure that this package actually reaches it. The initial problem, at least in the short run, is not so much what to do, but how to do it and how much human and financial resources it will require. While rural development projects with the potential to improve living conditions and productivity of large numbers of poor people in rural areas can be developed, it will take considerable time before their benefits materialize on a significant scale. Development of such projects will require a substantial commitment of technical personnel, since these projects have to deal with a number of complex and sensitive issues for which there is relatively little comparable experience elsewhere. The critical element in the rural development effort is likely to be the building of local institutions with competent sufficiently motivated staff, with enough autonomy to effectively plan, coordinate and deliver the various inputs and services required to improve the productivity and living conditions of the rural poor.

8. In 1969, a Bank agricultural sector survey mission visited Brazil. The mission evaluated agricultural conditions in the Northeast and presented a number of general strategy recommendations aimed at increased agricultural production and productivity without, however, focusing particularly on the small-scale farmer.

9. During the period 1971/72, loans were approved for an agricultural and technical education project (part of which was located in the North and the Northeast) and a land settlement project in the state of Maranhao. A special economic mission visited the Northeast in February/March 1972 to study the Government programs designed to benefit that region and, in line with the mission's recommendations, efforts were intensified to identify and prepare additional projects directed toward agricultural development in the Northeast. These included additional settlement schemes and a possible nutrition project, both intended primarily to benefit the lower income farm families, and an agro-industries project. Work also proceeded on related infrastructure projects such as the rehabilitation of the Port of Recife and the preparation of a primary education project for the North and the Northeast regions.

10. In early 1973, the Bank initiated conversations with the Government of Brazil with the goal of increasing the proportion of the Bank's lending for projects which would benefit low-income segments of the population. A number of missions and activities followed with the general objective of generating a pipeline of projects designed to increase the productivity of small farmers. These efforts can be classified in three general groups:

(a) regional activities, including the Program for Integrated Rural Development of Priority Areas of the Northeast and the joint research program of the Bank's Development Research Center (DRC) and SUDENE to improve knowledge of the problems and potential of small-farm systems;

(b) subregional or state-oriented, integrated project preparation work, including efforts in the Lower Sao Francisco Valley and the state of Rio Grande de Norte, and

(c) preparation of several functionally oriented programs in research, agro-industries, small- and medium-size industries, nutrition, feeder roads and rural education.

11. This report is intended as a complement to the other ongoing Bank activities in the Northeast to improve the understanding of major policy issues and institutional changes required for effectively reaching the rural poor through development projects.

12. The agricultural policies of the Government of Brazil have multiple objectives: they are supposed to stimulate output to meet the increasing demand of the population for food and fibers; they are expected to encourage production for export to make a substantial contribution to foreign exchange earnings; and, they are seen as instruments for raising income levels of the rural poor. The Government is increasingly realizing that it has, in the past, given too little emphasis to the last goal. This is because, while most officials have been and are deeply concerned about the low incomes of the rural poor in the Northeast, they have generally felt that the best way of relieving this problem was through expanding socially oriented programs in the fields of education, health, nutrition, sanitation and broadening the application of social security and labor legislation rather than through production oriented programs aimed at low-income groups.

13. The emphasis of governmental programs is beginning to shift somewhat as evidenced by the formulation of POLONORDESTE which is designed, inter alia, to raise the productivity and incomes of small farmers through integrated rural development projects. It should be recognized that large-scale programs to improve productivity of small farmers will be demanding in terms of allocation of government staff and institutional facilities, will require complex administrative arrangements, will have a long maturation period because of the time required to train and upgrade managerial capacity of farm operators and will carry a certain amount of risk in terms of the probabilities of achieving expected benefits. In particular, these programs must have special provisions to ensure that an appropriate share of their benefits accrues to low-income groups and is not preempted by larger farmers.

Organization of the Report

14. The rural poor in the Northeast is a combination of small landowners, renters, sharecroppers, tenant laborers and landless workers. Each subgroup's problems are unique and programs designed to improve the living conditions of any of them would necessarily differ markedly from programs designed to assist others. Chapter II includes an analysis of land tenure and income distribution patterns in Northeast Brazil and of the implications these have for identification of target groups for rural development programs.

A quantification of the absolute size and relative importance of these groups in the various states of the Northeast, based on census and sample survey data, is also attempted.

15. Since ownership of land and security of tenure are an important factor in determining whether investments are made and modern technologies are adopted, some feasible alternatives to lessening the land tenure problem in Northeast Brazil are explored in Chapter III. Among the issues discussed are the prospects for the Government's current land reform program, the distributional effects of providing term financing for land purchases and the potential of land taxation for encouraging land redistribution.

16. Agricultural research has a very specific role to play in the context of rural development and small-scale agriculture. First, it must develop cash crop varieties and techniques of cultivation adapted to the conditions in predominantly small farm areas. These crops and techniques should produce yields sufficiently high to create a marketable surplus above the farmers' requirements for self-consumption. Second, research should be closely integrated with extension so that its results can be obtained and demonstrated under the same ecologic and market conditions in which the farmer has to operate. Chapter IV deals with the interactions among research, technical assistance and small-scale agriculture in an attempt to indicate ways and appropriate means of delivering improved production packages to small farmers in the context of rural development projects. In particular, the availability of "modern" technology, the receptivity to such technology in a "high-risk" environment and the distributional effects of productivity increases are discussed.

17. While the immediate objective of institutional credit is to remove financial constraints to production, appropriate use of credit can facilitate the introduction of new technological practices. In addition, rural credit, because of its relationship to the marketing system, can be a powerful instrument for alleviating rural poverty. However, in spite of the substantial increase in the availability of rural credit in the Northeast over the last few years apparently very little additional credit has gone to small farmers. Chapter V includes a review of the orientation of current government credit programs in the Northeast and suggests possible ways in which they could be adapted to small farmer development. The institutional structure for delivering credit to small farmers is also assessed and possible improvements in the structure and orientation of credit programs for small farmers in Northeast Brazil are suggested.

18. Finally, Chapter VI deals with some of the effects of fiscal incentives on the efficiency and growth in manufacturing industry in the Northeast and the prospects for increasing labor absorption and a greater use of regional raw materials. In particular, the institutional and operational orientation of government programs for the support of small- and medium-size industries and agro-industries, and their implications for Northeast industrial financing are reviewed.

II. POPULATION TARGET GROUPS FOR DEVELOPMENT

A. The Northeast Environment

19. The Northeast is in general a semiarid region. Scarce rainfall is unevenly distributed throughout the year and only in the relatively narrow strip along the coast from Rio Grande do Norte to Bahia (Zona da Mata or humid coastal zone) and in some isolated microregions of the interior (Humid Valleys and Highlands), are environmental conditions more favorable (see Map No. 1). While most of the Northeast population (41%) lives in the semiarid Sertao, the greatest population densities can be found in the Agreste, a semiarid transition zone, and the Zona da Mata (Table 1). Agriculture is relatively diversified, the main activities being the commercial production of sugarcane and cocoa in the Zona da Mata, long staple cotton and sisal in the semiarid zones and the subsistence production of beans, corn and manioc throughout the region. The Agreste and the Sertao have experienced periodic severe droughts resulting in loss of crops and economic depression and which have caused waves of migration to other regions (see Map No. 3).

Table 1: DISTRIBUTION OF AREA AND POPULATION OF THE NORTHEAST BY ECOLOGIC SUBREGIONS

Subregions	% of Area	% of Population
Zona da Mata	7.2	27.3
Agreste	10.8	14.5
Sertao (semiarid)	52.4	41.0
Transition to Amazon	22.4	12.0
Humid Valleys and Highlands	2.4	4.5
Cerrados	4.8	0.7
Total Northeast	100.0	100.0

Source: SUDENE.

20. The rural population of the Northeast is composed of commercial farmers, traditional landlords, minifundia owners, tenant laborers, sharecroppers and landless laborers, with the mix varying considerably from

subregion to subregion. The mixture of land tenure arrangements and farm sizes makes design of rural development programs and projects a complex task. The development needs of different groups and their capacity to benefit from various programs, is a function of their role in the production process and their control over productive factors. The first task in the development of rural programs is, therefore, to identify the group or groups to be assisted and analyze its interrelations with other groups, its functions in the productive process and the endowment of productive factors it has at its disposal.

B. Farm Size and Income Distribution

21. Rural income distribution is closely related to the pattern of land ownership. Landholders, and particularly larger farmers, tend to have more control over other productive factors, greater access to markets and to yield-increasing services and inputs. Past studies of the Northeast have pointed to the high degree of concentration of land area in a relatively small number of large estates (latifundia or plantations), and to the atomization of a relatively small portion of the total land into very small farms (minifundia). Table 2 below clearly illustrates this. Establishments 1/ of less than ten hectares, which are regarded as minifundia in most subregions of the Northeast, represent 68.4% of the total number of establishments but control only 5.6% of total area. At the other extreme, establishments of over 500 hectares represent only 1% of the total number while accounting for almost 40% of the total area.

1/ By recording "establishments" instead of properties, the agricultural census treats as one several properties as long as they are contiguous and under the same management. Although it is an improvement over the use of "property" as the farm unit, the concept of "establishment" still understates significantly the concentration of tenure since it does not include within the same establishment discontinuous properties, nor registers subtenures within a specific property as separate establishments.

Table 2: DISTRIBUTION OF AGRICULTURAL ESTABLISHMENTS BY TOTAL AREA

Size stratum (ha)	Number of establishments (Thousands)	(%)	(Cum. %)	Total area (000 ha)	(%)	(Cum. %)
0 - 10	1,503.2	68.4	68.4	4,090	5.6	5.6
10 - 50	449.5	20.4	88.8	10,170	13.7	19.3
50 - 100	112.1	5.1	93.9	7,724	10.5	29.8
100 - 200	66.7	3.0	96.9	9,041	12.2	42.0
200 - 500	45.2	2.1	99.0	13,475	18.3	60.3
500 and over	22.8	1.0	100.0	29,312	39.7	100.0
Total	2,199.5	100.0		7,381	100.0	

Source: 1970 Agricultural Census.

22. It is often argued that large farms in the Northeast have a large proportion of "poor soils" and a small quantity of fixed investment per hectare, both factors which would tend to reduce average productivity of land and in practice reduce the inequality of the distribution of total farm income. Analysis of existing data, however, does not support this argument. An attempt has been made to adjust farm size to take into account differences in soil fertility and the stock of fixed capital by using average land values for each of the Northeast states and the proportion of soils of higher fertility reported in the SUDENE/IBRD farm survey, as well as average values of land sold and average rental values as reported by the Getulio Vargas Foundation. Indicators comparing the distribution of "Physical Area" (original census distribution as shown on Table 2) and "Equivalent Area" (including weights reflecting soil quality and land value) are presented for each state in ANNEX A and are summarized in Table 3 below.

Table 3: CHARACTERISTICS OF THE DISTRIBUTIONS OF LAND BY STATES OF THE NORTHEAST

States	Average farm size		Gini Coefficient		Exponential parameter of Pareto distribution /1	
	PA	EA	PA /1	EA /1	PA	EA
Maranhao	27.57	28.93	0.90	0.92	1.056	1.043
Piaui	43.92	49.48	0.88	0.83	1.068	1.102
Ceara	49.20	68.76	0.79	0.85	1.133	1.088
R.G. do Norte	44.13	49.96	0.85	0.89	1.88	1.062
Paraiba	27.07	54.30	0.81	0.88	1.117	1.068
Pernambuco	19.34	31.56	0.82	0.87	1.110	1.075
Alagoas	21.22	36.37	0.83	0.89	1.102	1.062
Sergipe	18.26	24.52	0.82	0.82	1.110	1.110
Bahia	40.36	75.67	0.79	0.84	1.133	1.095

/1 PA = Physical Area; EA = Equivalent Area.

Source: ANNEX A.

23. Comparison of the Gini coefficients of the two distributions shows that, with the exception of the state of Piaui, the distribution of wealth incorporated into land is even more skewed than land itself. The values of the Gini coefficient and the exponential parameter of the corresponding Pareto distribution 1/ also point to the extreme concentration of land and assets in all states of the Northeast. Thus, in general, the size of a farm in the Northeast should bear a close relation to its potential income generating capacity for its owners or operators.

24. In his work on income distribution in Brazil, Langoni 2/ obtained misleadingly low values -- around 0.37 -- of the Gini coefficient for the

1/ The Pareto distribution indicates greater concentration when this parameter has a value closer to one.

2/ Carlos Geraldo Langoni, Distribuicao da Renda e Desenvolvimento Economico do Brasil, Editora Expressao e Cultura, Rio de Janeiro, 1973. He used data on personal income collected in the 1970 Population Census.

personal distribution of income in Northeast agriculture. Langoni, however, attributed this to the fact that, in an economy where the only relevant difference in incomes is due to ownership of land and real proprietorship is perhaps limited to 5% of the population, the overwhelming majority of the population will show a substantial similarity of income profiles -- that is, uniformly poor -- and inequality (as measured by concentration indices) will appear to be low. Using a different measure of inequality -- the coefficient of skewness 1/ -- Langoni's data shows that personal incomes in the rural sector of the Northeast appear to be more unequally distributed than in the urban sector or than in Brazil as a whole.

25. In summary, the analysis indicates that the distribution of land is a good proxy for the distribution of capital and wealth in Northeast agriculture and that the distribution of income of the landholding individuals should be closely related to landholding size. This leaves the overwhelming majority of the Northeast rural population that is landless at the very bottom of the income distribution. In other words, in order to channel benefits to the poorer segments of the Northeast population, programs would have to be directed to the very small landowners and to the various types of landless laborers.

C. Land Tenure and Major Agricultural Population Groups

26. An attempt has been made to define and quantify the relative importance of population groups with respect to access to land, tenancy arrangements and related socioeconomic characteristics. Three basic groups can be distinguished: the wage laborers, the tenants and the owner-operators. The wage laborers can be divided into two subgroups: permanent and temporary workers, according to the degree of use of their work potential. This does not necessarily imply that permanent workers have a greater stability or contractual security than temporary workers. The most important tenancy arrangement in the Northeast is sharecropping, particularly in the semiarid zones. The forms of tenancy other than sharecropping are mainly rental arrangements and occupation of land with or without the consent of the owner. The farmers are thus either renters, moradores (the Portuguese word for

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1/ The coefficient of skewness describes adequately income distribution when only a small share of the population have incomes considerably above the average. A good discussion of its use as measure of inequality is contained in R. A. Young, "Do the statistics of concentration of wealth mean what they are commonly assumed to mean?", Journal of the American Statistical Association, Vol. 15, March 1971, pp. 471-484 and in J. Mincer, "Investment in Human Capital and the Personal Distribution of Income," Journal of Political Economy, August 1968, pp. 281-302.

Table 4: AGRICULTURAL POPULATION GROUPS BY TYPES OF OCCUPATIONS

(In thousand persons)

States	Wage Laborers		Tenants				Owner-operator	Total
	Permanent	Temporary	Sharecroppers	Moradores	Renters	Squatters		
Maranhão (Ma)	65.7	224.2	289.9	267.1	147.6	153.5	48.4	1,196.5
Piaui (Pi)	45.3	198.7	108.1	18.0	50.4	25.7	73.7	519.9
Ceará (Ce)	118.6	322.8	316.2	132.1	21.2	11.4	159.1	1,081.5
Rio Grande do Norte (RGN)	30.3	90.9	54.5	51.5	17.5	2.8	62.9	315.4
Paraiba (Pb)	53.6	122.9	91.4	192.7	33.1	10.7	108.8	613.2
Pernambuco (Pe)	171.8	305.4	203.6	161.2	59.1	53.2	202.7	1,157.0
Alagoas (Al)	53.6	102.8	123.4	50.2	18.2	11.8	74.3	440.3
Sergipe (Se)	10.7	44.2	95.5	35.7	12.0	6.0	71.7	275.8
Bahia (Ba)	251.3	628.6	395.1	257.0	18.8	209.1	455.0	2,214.9
Northeast (NE)	807.0	2,040.6	1,677.7	1,165.5	377.9	489.3	1,256.7	7,814.6/1

Sources: INCRA: 1967 and 1972 Cadastral Surveys;
IBGE: 1970 Agricultural Census; and
SUDENE/IBRD Agricultural Survey.

/1 Includes all part-time agricultural workers regardless of principal source of income.

Table 5: RELATIVE IMPORTANCE OF AGRICULTURAL POPULATION GROUPS (SHARE OF TOTAL LABOR FORCE BY STATES)

States/Groups	Ma	Pi	Ce	RGN	Pb	Pe	Al	Se	Ba	NE
Wage laborers	24.2	46.9	40.8	38.4	28.8	41.2	36.9	19.9	39.7	36.4
Permanent	5.5	8.7	11.0	9.6	8.7	14.8	13.5	3.8	11.3	10.3
Temporary	18.7	38.2	29.8	28.8	20.1	26.4	23.4	16.1	28.4	26.1
Tenants	71.6	38.7	45.1	41.6	53.4	41.2	46.2	54.1	39.6	47.5
Sharecroppers	24.2	20.8	29.2	17.3	14.9	17.6	28.0	34.6	17.8	21.5
Moradores	22.3	3.4	12.2	16.3	31.4	13.9	11.4	13.0	11.6	14.9
Renters	12.3	9.6	2.0	5.5	5.4	5.1	4.1	4.3	0.8	4.8
Squatters	12.8	4.9	1.1	2.5	1.7	4.6	2.7	2.2	9.4	6.3
Owner-Operators	4.2	14.4	14.7	20.0	17.8	17.6	3.4	26.0	20.7	16.1
Larger farmers	0.3	2.0	2.7	2.7	1.6	1.2	0.2	1.7	3.1	1.8
Smaller farmers and minifundia operators /1	3.9	12.4	12.0	17.3	16.2	16.4	3.2	24.3	17.6	14.3

/1 This group includes landowners with less than 50 hectares. Minifundista is the Brazilian expression for a farmer who owns a piece of land too small to generate enough income and absorb his available labor as well, thus forcing him to work on somebody else's land or in nonagricultural activities.

Table 6: AGRICULTURAL AREA CONTROLLED BY MAJOR TENURE GROUPS

(In hundred hectares)

States	Owner-Operators	Sharecroppers	Other tenants	Total
Maranhão	1,096,5	2,377.3	7,159.9	10,633.8
Piaui	5,289.6	1,696.6	2,540.7	9,526.9
Ceará	2,590.1	3,217.0	4,283.1	12,090.3
R. G. do Norte	799.8	2,605.2	1,496.5	4,601.6
Paraiba	2,038.4	1,143.0	1,418.7	4,600.2
Pernambuco	681.0	1,791.3	3,940.0	6,412.5
Alagoas	1,091.5	382.5	761.8	2,236.0
Sergipe	129.3	6,295.9	664.4	1,069.7
Bahia	14,315.2	3,279.3	4,363.6	21,958.2
Northeast	28,031.7	18,488.5	26,609.1	73,129.5

Table 7: SHARE OF AGRICULTURAL AREA CONTROLLED BY MAJOR TENURE GROUPS

(In percentages)

States	Owner-Operators	Sharecroppers	Tenants
Maranhão	10.3	22.4	67.3
Piaui	55.5	17.8	26.7
Ceará	21.4	43.2	35.4
R. G. do Norte	17.4	50.1	32.5
Paraiba	44.3	24.9	30.8
Pernambuco	10.6	28.0	61.4
Alagoas	48.8	17.1	34.1
Sergipe	12.1	27.7	60.2
Bahia	65.2	14.9	19.9
Northeast	38.3	25.3	36.4

occupants) or squatters. Tables 4 and 5 present estimates of the absolute and relative importance of these subgroups by state. 1/

27. Although the shares of these groups in the total labor force vary considerably from state to state, it is clear that for the Northeast as a whole, the largest subgroups are the sharecroppers and the temporary laborers which together account for about half of the economically active population. More than 80% of the agricultural labor force does not own land. The development potential of this overwhelming majority which constitutes the core of the rural poverty problem is conditioned by the various formal and informal practices which regulate the relations between ownership, entrepreneurship and labor. In addition, at least 68.4% of the owner-operators are minifundia operators (establishments of less than ten hectares from Table 2). 2/ Thus, in order for programs to have a significant impact on rural poverty, they must be directed at landless laborers, tenants and to farm owners whose holdings are so small as to raise doubts about their economic viability.

28. For the Northeast as a whole, less than 40% of the agricultural land is exploited directly by owner-operators. Sharecroppers, the most important form of subtenants, cultivate over one-fourth of the agricultural land. In some states, over four-fifths of the agricultural land is being cultivated by non-owners. Thus, in spite of the concentration of land ownership, most of the land is actually cultivated by tenant farmers with more or less precarious forms of tenure. The insecurity of land tenure, coupled with irregular rainfall leads to risk-averting behavior, hampering farm investment.

D. Socioeconomic Characteristics of the Main Population Groups

29. Present land tenure relationships reflect a mixture of historical, sociological and economic factors. These relationships are solidly rooted in the Northeast and unless rural development programs take them explicitly into account, these programs are unlikely to succeed. The most important groups that exercise some form of tenure over land are the landowners, the sharecroppers and the squatters.

1/ It should be pointed out that while these groups have been defined numerically to fit with the total labor force, in practice, there are considerable overlaps among them since the same individual, for example, could simultaneously be a sharecropper and a small landowner or a wage laborer on somebody else's land.

2/ The Land Statute prohibits the fragmentation of farms below a "module" size defined by the area required to generate four minimum salaries in income. This minimum size lies principally in the range of 20 to 35 hectares in the Northeast. Small farms of less than ten hectares are considered acceptable units of fragmentation only in areas adjacent to capital cities where highly profitable horticulture is possible.

i. The Landowners

30. There are, in general, three main groups of large landholders: traditional, transitional and commercial. This classification excludes the smaller landowners which generally do not control sufficient land to require more than family labor and whose economic characteristics are in some respects closer to those of sharecroppers than to large landowners. Data from the SUDENE/IBRD farm survey indicate that in the interior of the Northeast landowners with farms of over 50 hectares constitute about 2% of the rural population. These landholders are endowed with 35% of the land and receive about 25% of total agricultural income.

Table 8: CHARACTERISTIC OF LANDOWNERS IN THE INTERIOR /1 OF THE NORTHEAST

Types of landowners /2	Proportion (%)		Composition of farm labor		% of land available that is cultivated
	Number	Area	% of wage labor	% of sharecropping labor /3	
Traditional	31	48	5.1	94.9	25.4
Transitional	15	38	21.4	78.6	65.4
Commercial	54	14	70.3	29.7	88.7

/1 Excludes coastal Zona da Mata.
/2 Excludes landowners with less than 50 hectares.
/3 Includes moradores and sharecroppers that also receive wage payments.

Source: SUDENE/IBRD Survey.

31. In general, the traditional landlords have large estates which are only partially cultivated. They tend to control a labor force largely composed of sharecroppers and resident workers (moradores). In contrast, the commercial landlords exploit most of the land available and prefer to cultivate it through hired (and temporary) labor and control comparatively smaller farms. The traditional landlords exhibit what may be called feudalistic characteristics as exemplified by the fazenda. This is an almost self-contained economic unit with very limited monetary exchange with the outside world. The social structure is pyramidal with a large number of administrators, coordinators, contractors, etc., mediating the relationship between the landlord and the mass of the workers who are attached to the land by various tenure obligations. Often, a small army of pistoleros has the function of internal police and of armed protection against the rest of the world. Most of these landlords (perhaps 80% or more) live in the fazenda or very close to it. The strength of this group is not wealth as such -- indeed, some of them would be quite poor measured by Center-South standards -- but rather a mixture of social, political and military power which are the remains of hereditary wealth.

32. The transitional landlords are either commercial operators who have acquired feudal estates and are conditioned by the preexisting structure, or feudalistic landlords who have become more commercially oriented. In either case, there is a conflict in this group between the feudal characteristics of the economic unit they run and the objective function which they try to maximize which is profit and market-oriented. Many of the landlords in the Serido, the typical cotton area of Rio Grande do Norte, Paraiba and Ceara belong to this category. The feudal characteristics of their farms do not prevent them from being highly rational in their economic behavior, exploiting their monopsonistic position in the labor market and in the market for the output of their sharecroppers. The commercial motivation of the transitional landlord tends to weaken the paternalistic link with the worker and it is in the farms controlled by this group that tenancy is least secure and the distribution of output between landlord and sharecropper least equitable.

33. It is difficult, even in the more commercial zones like the cotton areas, to find large farmers who are completely market-oriented and do not, to a degree, take advantage of the privileges of their landed position in a relatively primitive society. Nevertheless, an increasing number of operators in this group are tending to acquire commercial characteristics and are much more responsive to market signals. This is certainly true when there is an element of vertical integration (e.g., a cotton firm purchases a farm and uses the previous owner as an administrator) and when improving market perspectives encourage the landowner to evict the sharecroppers and run the farm directly through hired labor in order to capture a greater share of higher profits. Although many of the commercial landowners may ultimately side with the traditional landlords in rejecting tenure reforms or the enactment of regulations improving sharecropper's security of tenure, many others who do not have their roots in the rural society are profit-oriented and could be led to accept changes leading to higher profitability which otherwise are disruptive of the traditional society in which they operate.

ii. The Sharecroppers

34. Sharecropping is the main form of agrarian contract in the Northeast. Apart from the fact that sharecroppers directly represent almost one-fourth of the agricultural labor force, sharecropping elements are present in an open or disguised way in most of the contractual relations between landlords and peasants. The sharecropper is usually involved in production of cotton or rice as a cash crop and a number of subsistence crops (usually corn, beans and manioc). Basically, the sharecropping arrangement provides for a transfer of a proportion of the harvest of the cash crop to the landlord in exchange for permission to use the land for the production of both the cash crop and the subsistence crop by the sharecropper.

35. In the most typical form of sharecropping -- especially in cotton areas -- the owner or his administrator is strongly involved in the management of the whole farm. At times, part of the farm, usually livestock production, will be totally administered by the owner. The various sharecroppers on the farm divide their time between working the part of the farm administered by the owner and on their own plot. After five or six years, the land of their original plot is usually no longer fit for cotton growing and the worker is moved to another part of the farm.

36. In any variation of sharecropping arrangement, the proprietor generally provides the worker a better livelihood than he can obtain working as a wage laborer. However, his ultimate dependency on the landowner for cash advances for subsistence makes him extremely vulnerable to exploitation and often puts him in a situation of perpetual indebtedness. Comparatively low prices for the product he produces and wide oscillations of production due to pests, diseases and periodic droughts make it extremely difficult for him to repay these advances. Consequently, the sharecropper is often forced to give most of his production to the landlord as reimbursement for past loans.

37. In order to eliminate some of the exploitive features of sharecropping arrangements, attempts have been made through labor legislation to transform sharecropping arrangements to more permanent labor contracts. Tenure rights have been established for tenant workers who have invested in or have farmed the same land for a relatively long period of time. Guidelines for sharing the costs of inputs and the final output, as well as the right to compensation in case of eviction, have been explicitly incorporated in the legislation.

38. These laws, however, have proven very difficult to enforce and are frequently abused. For example, to avoid compensating sharecroppers in the case of eviction established by law, the land is often given to the sharecropper already tilled and recently planted in cotton. 1/ Sharecroppers' plots have also been reduced in size and the proportion of wage labor used within the farm, drawing in part on the sharecropper's time, has increased remarkably. In addition, whenever possible sharecroppers are shifted from one plot to another to minimize their attachment to a particular piece of land and thus prevent possible tenure claims. In general, the attempts to improve sharecropping arrangements have drastically reduced the number of "pure" sharecroppers -- that is, those who work only on their own plot -- and have contributed to making the worker more mobile and insecure. 2/

iii. The Squatters

39. A form of nomadic squatter farming is prevalent in the preamazonic areas of northeastern Maranhao and southern Piaui. The migrants who come from the poorest areas of the Sertao occupy public land still covered by forest and subject to periodic inundations. Because of the nomadic characteristic of the agriculture practiced, its isolation, absence of proper medical care and lack of medicines these people are subject to a variety of mass diseases such as malaria, tuberculosis and verminosis. 3/

1/ Notice that this single provision implies that the sharecropper be shifted to a new plot once the economic life of the cotton is over (5-6 years in general). Since in this case the cotton trees belong to the landlord, in case of eviction, the sharecropper would be entitled to compensation only for his share of the pending harvest.

2/ Security of tenure, of course, would only be a goal where the land could support continuous cropping, or where sufficient land could be made available to support fallow land requirements.

3/ See the Report on the Health Survey from the Institute of Social and Economic Research (IPEI) of the state of Maranhao. See also H. Dormas, Dinamica da Ocupacao do Meio Rural no Nordeste Maranhense, SUDENE, 1974.

40. It is difficult to establish the number of nomadic squatters. The 1970 Agricultural Census lists 57% of the establishments in Maranhao and 22% in Piaui as being inhabited by "occupants". However, the census definition of occupant also include occupants of private land, who have completely different socioeconomic characteristics. Preliminary results of the SUDENE/IBRD survey, based on a subsample by area of the subregion where the phenomenon is most prevalent, suggest that there might be over 100,000 families of squatters in Maranhao alone.

41. Shifting cultivation migrants in the preamazonic region involves four basic stages: 1/

(a) breaking and settling in;

(b) burning the forest and cultivating rice (cash crop), corn, beans and manioc (subsistence crops);

(c) moving the cultivated area by burning areas of the forest farther and farther away from the farmer's hut; and

(d) finally, moving the hut to the boundary of a new exploitable area.

42. The migrant is forced to leave his field every two or three years because of exhaustion of fertility (due to the shallowness and the sandy structure of the preamazonic soils) and proliferation of weeds, which he has neither the technology nor the labor to fight. Nomadic settlement is generally followed by occupation of the land by large cattle raisers who come in with a sizeable herd and numerous workers and who are often not averse to using force while pressuring the squatters to move on as soon as land is cleared. The migrant then has the choice between moving further west to clear more forest and staying on the land of the cattle raiser as a dependent worker.

43. The squatters on public land are a rapidly growing problem in Northeast Brazil. The states of Maranhao, Piaui and Bahia are the main areas into which squatters are attracted. Under a controlled settlement program, areas in these states could offer conditions for settling some 200,000 families. The main impediment to development of settlement projects is that there is no known technological package suitable to the ecological conditions which would enable the migrant to farm without having to move within a very short time.

44. Development of a technology which would make settlement projects in the preamazonic areas possible should have high priority because such projects would:

1/ See H. Dormas, op. cit.

(a) permit absorption of a relatively large number of landless families from the semiarid zones;

(b) provide a framework for government services and protection of the rights of spontaneous settlers vis-a-vis ranchers that might attempt to evict them from their land; and

(c) improve living conditions and enhance survival prospects of one of the most dramatically poor segments of the Northeastern rural population.

E. Implications for Rural Development

45. It should be reemphasized that the distribution of land and the associated distribution of income are very unequal in the Northeast, that a large majority of the economically active population in agriculture does not have the benefit of land ownership and therefore can share in the benefits of regional growth only to the limited extent permitted by precarious labor arrangements. As an indication of the extent of rural poverty, the 1970 Demographic Census found that 70% of Northeast rural families earn less than the regional legal minimum salary (about US$50 per month). Recent studies estimate a level of unemployment in the rural sector of the order of two million people, or more than 20% of the labor force. 1/ Apart from equity considerations, the landlessness of the Northeast population is symptomatic of a serious misallocation of resources and of the frustration of the growth potential of Northeast agriculture of Brazil in general.

46. One means of attempting to raise the living standards of the landless population is enactment of legislation to raise social benefits. This strategy is somewhat risky because agriculture is quite flexible in its ability to substitute capital for labor, so that, for example, the principal result of raising minimum wages or other labor costs could be greater unemployment. 2/ Another approach might be to stimulate commercial agriculture, depending on the resulting increase in demand for labor to benefit the underemployed rural population. In the context of underemployment and surplus labor, the best that can be hoped for from this policy is an increase in the

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1/ In particular, see D'Apote V., et. al. Bases Para una Politica de Colonizacao e Reforma Agraria no Norte do Brasil, SUDENE - Divisao de Documentacao, Recife, 1972.

2/ Thirsk has estimated the elasticity of substitution between labor and farm machinery in Colombia to be in the neighborhood of 1.5. This means that a 10% rise in the wage relative to the cost of capital will induce a 15% reduction in the amount of labor combined with each unit of capital; thus, aggressive wage increases are likely to lead to a substitution of labor by farm machinery. See W. Thirsk, "Ease of Factor Substitution in Agriculture," Rice University Program of Development Studies, Paper No. 34, 1972.

number employed at an unchanged wage (rather than an increase in wage rates). The "large commercial farm" strategy, while probably contributing to larger increases in output in the short run, is likely to concentrate rural income still further by raising the share of profits in revenues.

47. Further commercialization of agriculture is likely to increase the skewness of distribution of rural incomes for another reason. In a number of cases in the Northeast, it has been observed that as soon as technological change increases profits or reduces risks, there is a clear tendency for the landowner to evict the sharecropper and utilize hired labor at a fixed wage instead. While this tendency is probably inevitable, rural development projects could inter alia, help to introduce tenancy contracts which would smooth out this transition and make is less damaging to the sharecroppers. In particular, three main elements of contractual innovation seem most promising as far as improving the sharecroppers' situation is concerned: cost-sharing, long-term tenancy agreements and fixed-rent agreements incorporated into "new" share contracts. However, it should be pointed out that past attempts to do this have not been successful and complications involved in enforcement could well result in bogging down of efforts to strengthen delivery of technical improvements.

48. Cost-sharing arrangements, which have been used in other parts of the world such as Italy, India and Mexico to improve the sharecroppers' situation, are rarely used in Northeast Brazil. The only traces of cost-sharing in the region are nominal contributions of the landlord in the form of seeds and maintenance which are both eventually deducted from the final share of production of the workers. If landlords are to accept cost-sharing, they must be convinced that a particular innovation, which is feasible and profitable, will not be adequately adopted by the workers unless related costs and risks are shared. A number of landlords in the municipios of Caico and Florania in the Serido area of Rio Grande do Norte have expressed willingness to finance part of the expense of modern inputs and even labor, if profitability of the operation could be clearly established.

49. Long-term tenancy agreements and fixed rent agreements would also constitute substantial improvements in the sharecropper's condition. Under present arrangements, granting tenancy security is not appealing to the landlord because by removing the threat of eviction it decreases the pressure on the worker so that more supervision is necessary to ensure a high labor performance. In addition, it increases the possibility that the worker will, in the future, be granted legal rights to the land that he has continuously farmed. Again, if substantial benefits can be generated through a program of credit and technical assistance, at least some of the more commercially oriented landlords might be convinced to yield some concessions in granting of longer term tenancy. The success of such an initiative depends on designing the program so that the landlords adopting it would receive substantial, even if temporary, benefits over the landlords who refuse to offer longer contracts. The fact that their farms would be selected for an investment project might in itself be an incentive to the relinquishing of privileges.

50. Changing share tenancies into fixed-rent tenancies appears a priori more difficult to achieve as the sharecroppers themselves might oppose this since it would force them to assume more risk and place them in a more vulnerable situation. In large areas of the Northeast, however, the share rental contracts already in existence are close to fixed-rental arrangements since only a minimum of supervision is provided by the landlord and the tenants are expected to attain a predetermined volume of production. Rather than transforming share-rental to fixed-rental agreements, which would meet with sharecropper resistance, a second best solution might be to introduce a credit insurance scheme to reduce the tenant's vulnerability to shortfalls in production and thus improve their access to institutional credit.

51. Introduction of increased security of tenancy, cost-sharing, and fixed-rent arrangements might be indirectly reinforced through the promotion of particular cropping patterns. Cultivation of perennial crops is more likely to be associated with longer term contracts, as is cultivation of crops which require skills not readily transmissible from one worker to the other. In the Mediterranean area, for example, cultivation of vegetables such as tomatoes or fruit crops such as grapes, has always been associated with more secure dynamic forms of tenancy and has contributed to the formation of a class of skilled agricultural workers with substantial bargaining power in their claims to land, salaries and better working conditions.

52. All the above suggestions are ways of alleviating an undesirable situation without fundamentally changing it. However, in many areas of the Northeast, the policy most likely to both increase agricultural production and improve rural income distribution is spreading of direct control of productive land over a wider range of the population, either by facilitating the market purchase and subdivision of land or by land reform. These alternatives will be explored in greater detail in the following chapter.

III. POSSIBILITIES FOR LAND REDISTRIBUTION

A. General Considerations

53. There is ample empirical evidence that the redistribution of large estates into family farms would raise agricultural production capacity and improve the income levels of the rural poor. A CIDA study 1/ has documented the low utilization of land on large farms in Brazil, the high output per available land area on smaller farms and the inefficiency inherent in a situation in which there is concentration of unused land on large estates while underutilized labor is crowded onto minifundias for lack of land. The same pattern of structural inefficiency was found in CIDA studies for several other Latin American countries.

54. Agricultural production functions estimated on the basis of sample survey data for approximately 1,000 farms in seven states in Brazil has shown constant returns to scale for factors actually utilized -- indicating that there is no inherent superiority of large-scale operations over small-scale. 2/ At the same time, regression estimates have indicated that land utilization consistently declines as farm size rises, even with the influence of land quality removed by the inclusion of land price as an explanatory factor. When these two findings are combined, the clear implication that emerges is that a redistribution of land from large estates into a family farm sector would raise production due to the increase in use of land and improvement in use of formerly underemployed labor. Conservative estimates based on simulations suggested that the output rise could be on the order of 25%. Naturally, these estimates should not be taken to indicate that a major land reform would produce a quick increase in output. On the contrary, most actual experiences with land reform have resulted in short-term declines in output (at least for the market). However, given the availability of unutilized land in Northeast Brazil, a well-designed, selective land reform program would clearly have the potential for increasing output.

55. In the case of the Northeast, data from the SUDENE/IBRD farm survey of 1973 shows dramatic declines in the utilization of land as farm size rises. This pattern is evident in the ratio of production to total farm area available: the ratio falls as farm size rises, a phenomenon familiar from earlier studies. A stronger test of relative land utilization may be made, however, if land quality is compensated for (since it is frequently argued that poor land quality on larger farms explains their relatively lower output per area available). The SUDENE-IBRD data report total land value, which may be considered

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1/ Comite Interamericano de Desarrollo Agricola (CIDA). Land Tenure Conditions and Socioeconomic Development of the Agricultural Sector, Brazil (Washington, D.C.: Pan American Union, 1964).

2/ See W. Cline, Economic Consequences of a Land Reform in Brazil, (Amsterdam: North Holland Publishing Co., 1970).

to represent land available after standardization for quality (both physical and in terms of location). Table 9 presents data from the survey showing the ratio of production value to land value, by farm size group for each of the seven sub-regional zones in the survey. It is evident from the table that production obtained relative to value of land available systematically declines as farm size rises, indicating serious underutilization of land on large estates even after considering differences in land quality. The implication is that there would be considerable scope for increased agricultural production through a redistribution of land currently in large estates into family farms created in a land reform program. It is perhaps worth special attention that the poorest relative performance indicated in the table is for farms over 500 hectares in the "humid east" (zone E), the rich lands of the Zona da Mata extending from Rio Grande do Norte in the north to the upper portion of Bahia in the south.

Table 9: RATIO OF PRODUCTION VALUE TO VALUE OF TOTAL FARM LAND AVAILABLE, BY FARM SIZE GROUP AND ZONE

Size Group (ha)	Zone A	B	C	D	E	F	G
0 - 9.9	2.531	1.086	.577	n.a.	1.039	.479	1.046
10 - 49.9	1.153	1.257	.760	.237	.243	.268	.400
50 - 99.9	.421	.659	.498	.302	.373	.182	.287
100 - 199.9	.262	.451	.148	.101	.244	.250	.192
200 - 499.9	.127	.315	.483	.109	.284	.192	.141
500 and over	.170	.560	.430	.074	.043	n.a.	.167

Zones: A - Low demographic density (west of Maranhao, Piaui, Bahia); B - middle north (east of Maranhao, north of Piaui); C - semiarid Sertao (portions of Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Bahia); D - semihumid southwest (portion of Bahia); E - humid east (coastal zone of Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, northern Bahia); F - humid southwest (cocoa zone of Bahia); G - Agreste (transitional zone of Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, Bahia).

Source: SUDENE/IBRD Farm Survey.

Note: Data refer to farms not receiving credit.

56. It may be objected that production function estimates such as those described above draw upon data which reflect an existing class of backward latifundia and that a program to transform these large owners into modern farmers would stimulate output more than a redistribution of land into family size farms. This alternative view discounts the basic fact that Northeast Brazil is a labor abundant and capital scarce economy, and that

the chief source of whatever economies of scale might exist is farm mechanization. In an environment where labor is cheap and abundant, mechanization would represent a misallocation of resources, made only possible by heavy subsidization of capital. Moreover, the notion of large economies of scale in agriculture is more myth than fact, even in more developed countries, as is demonstrated by the frequency of constant returns to scale identified in production functions such as those for the United States. 1/

57. There is little doubt that land redistribution would increase rural income distributional equity. However, there is a danger that in carrying out land reform, an elite middle class of farms may be created without absorbing the bulk of the rural population onto the reform sector (even in the face of widespread transfer of agricultural land). 2/ A fundamental feature of production of very large farms is that they use too little labor relative to their availability of land and, often, relative to capital. 3/ Hence, if large properties are expropriated and turned over to their existing labor force, the recipients may receive an endowment of land which is excessive considering the aggregate availability of land relative to the rural work force. In the case of land reform in Brazil's Northeast, current policy concentrates on areas not in production on large estates. Therefore, turning such areas into productive reform parcels can only increase employment and output. Nevertheless, there is the tendency to create quite large reform parcels, thereby losing the opportunity to convert the land into smaller units more consistent with equity considerations.

58. While land redistribution is important in the Northeast generally, it would be particularly important in the Zona da Mata. Despite the fact that the land is the best in the Northeast, much of the farm area of the sugar estates of the zone lies unused. Of 776,000 hectares of sugar farms in the Zona da Mata of Pernambuco, only 42% of the land is planted with sugarcane or other crops; the proportion is only 38% for farms over 500 hectares. A separate earlier study by the Getulio Vargas Foundation found a virtually identical fraction of land in use: Pernambuco sugar estates were at that time cultivating only 42.6% of their land with sugar or other crops compared to 76.9% found in sugar estates in Sao Paulo 4/ by the same study.

1/ See, for example, E.O. Heady and John L. Dillon, Agricultural Production Functions, Iowa State University Press, Iowa, 1961.

2/ See, for example, R. Berry, "Land Reform and Agricultural Income Distribution," Pakistan Development Review, Spring 1971, Vol. 11, No. 1, pp. 30-44.

3/ This has been confirmed by econometric tests carried out for Brazil. See W. Cline, op. cit.

4/ Fundacao Getulio Vargas, Instituto Brasileiro de Economia, Pesquisa Sobre Condicoes de Custos de Producao da Laboura Canaviera (Rio de Janeiro: Fundacao Getulio Vargas, 1965).

59. To a large extent, sugar estates leave land idle because production of sugar is controlled and each producer must have an official quota. Extension of cultivation (particularly in past years of weak world market conditions) would have raised production over quotas. At present however, quotas have been temporarily suspended to allow Brazil to take advantage of strong world demand. Idle land had not been put into other crops because of the strong view of plantation owners -- not substantiated by available data -- that the market for foodstuffs is inconsequential and that, in any case, nothing but sugar would grow in this humid zone. 1/ In addition, large landowners hold land partly as a portfolio asset rather than for production.

60. Sugar estates dominate agriculture in the Zona da Mata. In Pernambuco, sugarcane farms over 500 hectares account for 709,000 hectares (Table 10), or approximately 70% of the Zona da Mata area of that state. 2/ Their domination of the area, combined with their low land utilization, means that the Zona da Mata, as a whole, has low land utilization. As can be seen in Table 11 below, this ecological zone constitutes one-third of the total land value of the five states in which it falls. 3/ Yet, it absorbs only one-fifth of the region's labor. Labor, which could be employed on this relatively fertile land, instead is either crowded onto minifundia in the semiarid Agreste region, or is working on extensive cattle or cotton farms in the Sertao. This apparent misallocation is especially noticeable in the two crucial sugar states, Pernambuco and Alagoas, where the Zona da Mata contains 43% of land value but employs only 23% of total labor.

1/ The myth that only sugar will grow in this region has been challenged by actual experience in the Rio Tinto and Caxanga land reform experiments and inter alia by B. Dantes in A Recuperacao da Lavoura Canaviera de Pernambuco Com base no Aumento da Produtividade e Intensificacao da Policultura (Recife: Estacao Experimental dos Produtores de Pernambuco, 1965).

2/ These figures from the INCRA cadastral survey as processed by EAPA in the Ministry of Agriculture are very close to earlier estimates by Rose e Silva Neto who noted that in 1966, sugar mills over 1,000 hectares possessed 517,000 hectares, while smaller, independent sugar "suppliers" (fornecedores) held 350,000 hecatres. Neto also noted that in Pernambuco's Zona da Mata, the average size of the 2,200 sugar farms was 800 hectares, while that of the 22,000 nonsugar farms was only 22 hectares. See Rose e Silva Neto, Contribuicao ao Estudo da Zona da Mata em Pernambuco: Aspectos Estruturais e Economicos da Area de Influencia das Usinas de Acucar (Recife: Instituto Joaquim Nabuco de Pesquisas Sociais, 1966), p. 84.

3/ Land values at the municipio level should become available when the 1970 agricultural census is fully processed. In the absence of this data, table draws upon the "minimum price per hectare" established by INCRA for each municipio in the administration of the land tax. These minimum prices are all quite low compared to actual market prices but they should be adequate indicators of relative land values among municipios and subregions.

61. Despite the underutilization of land in sugar estates and the possibility of greater labor absorption onto this land, it is important to recognize that the sugar estates do represent large productive entities with ongoing production employing a substantial number of workers. The sugar economy employs 300,000 workers 1/ in the Zona da Mata of Rio Grande do Norte, Paraiba, Pernambuco, Alagoas and Sergipe, or half of total agricultural employment for the zone (Table 11). In addition, the sector employs on the order of 40,000 industrial workers in sugar mills. Reform therefore should seek to increase land utilization, rather than to break up productive units. The Brazilian approach of "selective" reform leaving large operating activities untouched has the merit of not jeopardizing current sources of production and employment for a mass of population while holding out the possibility of increasing efficient use of land and labor.

62. While one of the constraints on land reform in the Zona da Mata has been the depressed market situation for sugar, the world sugar market has dramatically strengthened in recent years. While the world sugar market is notorious for large cyclical swings, medium-term price prospects are at present considered sufficiently buoyant that, in addition to not enforcing quotas, the Sugar and Alcohol Institute (IAA) is encouraging new sugar mill investments in Amazonas, Ceara, Espirito Santo, Rio Grande do Sul and Minas Gerais. Thus, the prior constraint of absence of sugar quotas to award to land reform parcel recipients in the Zona da Mata seems to have disappeared. On the contrary, technicians at INCRA in Recife report that several owners of sugar usinas from which land reform areas have been acquired are pleased at the prospect of an increase in their potential sugarcane supply expected from the bringing into production of land placed in land reform parcels. The owners also anticipate that increased food production on these parcels will improve the situation for their own salaried labor by lowering food prices.

B. The PROTERRA Land Reform Program

Background

63. In 1964, the new military government instituted a very comprehensive land reform law in Brazil, the Estatuto da Terra. However, there were only very limited land reform experiments in the Northeast or the rest of Brazil during the remainder of the decade. These cases of land reform are summarized in Table 12. As a result of a visit of President Medici to the Northeast during a severe drought in 1970, PROTERRA, a program with budgetary

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1/ Cline estimated agricultural labor for sugarcane in the Northeast to be 14.5 work days per ton of cane. W. Cline, "Land Reform in Northeastern Brazil, with Special Reference to the 'GERAN Plan' and to Colonization," AID Summer Research Project (Washington, D.C.: Mimeograph, 1967), p. 20. Based on production of sugarcane of 20.5 million tons in this zone in 1970, estimated agricultural labor required would have been 297,000 workers.

Table 10: USE OF LAND AND TOTAL AREA OF FARMS PRODUCING SUGARCANE IN THE ZONA DA MATA OF PERNAMBUCO

(In hectares)

Size of farm	Area planted with sugarcane	Area on permanent crops	Area on pastures	Area on forestry	Other areas	Total
0 - 1	22.1	4.0	--	--	--	26.1
1 - 2	117.8	60.4	4.9	3.1	0.7	186.9
2 - 5	605.5	241.8	121.3	80.0	341.2	1,389.8
5 - 10	1,261.7	451.4	331.6	136.9	1,480.4	3,662.0
10 - 25	2,413.4	834.3	633.6	322.7	2,175.7	6,379.7
25 - 50	2,972.5	783.1	914.8	709.2	2,755.5	8,135.1
50 - 100	5,071.4	945.2	1,332.2	925.4	3,520.1	11,794.3
100 - 200	15,298.0	2,598.2	4,679.2	2,922.9	9,192.3	34,690.6
200 - 500	84,383.2	11,970.3	25,115.0	30,363.5	47,650.3	199,482.3
500 - 1,000	85,345.1	15,633.9	29,662.1	45,826.3	61,420.8	237,888.2
More than 1,000	79,767.0	14,991.1	32,264.3	50,953.9	94,464.9	272,441.2
Total	277,257.7	48,513.7	95,059.0	132,243.9	223,001.9	776,076.2

Source: INCRA-Cadastre of Rural Properties.

Table 11: RELATIVE IMPORTANCE OF THE ZONA DA MATA IN FIVE NORTHEASTERN STATES

	A	B	C	D=BC
	Labor (1,000)	Land area (1,000 ha)	Average minimum land price (Cr$ /ha)	Land value at minimum price (Cr$ million)
A. TOTALS				
Rio Grande do Norte	315	4,602	41.7	191.9
Paraiba	613	4,600	47.9	220.3
Pernambuco	1,157	6,412	50.0	320.6
Alagoas	440	2,236	61.5	137.5
Sergipe	276	1,751	52.1	91.2
Total	2,802	19,601	49.0	961.5
B. ZONA DA MATA				
Rio Grande do Norte	70	946	53.6	50.7
Paraiba	91	404	102.3	41.3
Pernambuco	211	983	122.7	120.6
Alagoas	153	1,045	74.5	77.8
Sergipe	70	468	54.7	25.6
Total	596	3,846	82.2	316.0
C. ZONA DA MATA AS % OF TOTAL				
Rio Grande do Norte	22.2	20.6		26.4
Paraiba	14.8	8.8		18.7
Pernambuco	18.2	15.3		37.6
Alagoas	34.8	46.7		56.6
Sergipe	25.4	26.7		28.1
Total	21.3	19.6		32.9

Source: Column A, B: 1970 Agricultural Census. Column C: Calculated from Ministerio da Agricultura, Institutio Nacional de Colonizacao e Reforma Agraria. Informativo Tecnico - I. Indices Basicos - 1973 (Rio de Janeiro: INCRA, 1974). The "minimum land price" accepted for tax purposes is designated for each municipio by INCRA. Multipying this price by farm land area in each municipio gives the statewide and Zona da Mata aggregate land values and hence, the average minimum land price figures for Column C. (The price refers to the 1973 tax year.)

Note: Zona da Mata includes the following microregions as defined in the 1970 Census: Rio Grande do Norte: Salin. Nort. R.G., Litoral Sao Bent., Natal; Paraiba: Litoral Paraib., Agro Pastoril Baixo Par.; Pernambuco: Mata Seca, Recife, Mata Umida; Alagoas: Mata Alagoana, Litoral Norte Alag., Tabuleiro S. Mig. C., Maceio, Penedo; Sergipe: Propria, Cotinguiba, Litoral Sul Serg.

resources of the order of Cr$4 billion (US$1 billion at that time) for agriculture in the Northeast, covering the period 1972-76, was created. Although the name of the program, "Program of Redistribution of Land and Support for Agro-industry in the Northeast," conveys the impression of a land reform program, there actually have been very limited expenditures for this purpose under the program, which has instead channeled substantial subsidized credit resources to farmers under existing tenure arrangements.

64. Farms subject to land reform were those classified by the 1966 cadastral survey as "Latifundio Por Exploracao," (large estates eligible for expropriation) by virtue of poor utilization of land. PROTERRA provided a sliding scale of land transfer, from 20% of land on such farms beginning at 1,000 hectares, up to 50% of the area in such farms over 5,000 hectares. Initially, PROTERRA provided that large landowners in the priority Zona da Mata areas of Pernambuco and Paraiba could develop programs for land reform on their own lands. Under this arrangement, the farmers would select land to be transferred, would designate workers to be the land recipients and would determine feasible cropping patterns. Landowners presenting such programs would be considered to have "adhered" to the program and would receive payment in cash for the land transferred, whereas nonadherents would have land expropriated and would be paid in unindexed bonds.

65. Action under PROTERRA began very slowly. Farm classified as latifundia had the right to a vistoria, a field examination by INCRA officials to determine whether their improvements since the 1966 cadastral survey qualified them as "rural enterprises," hence, making them exempt from expropriation. 1/ Even more important, the bureaucratic organization of the program led to responsibility being divided among three institutions with differing objectives. Owners were supposed to present projects to INCRA, which, because of staff constraints, was to draw upon technicians of the Bank of Brazil and ABCAR (the extension agency). The Bank of Brazil was to evaluate the property for land purchase purposes and ABCAR was to evaluate the feasibility of the crop schemes for the project to be instituted. Most projects were sent back for correction by at least one of the three entities. 2/

66. The process of owner preparation of land distribution proved unworkable and actual purchase of land for transfer occured only after the burden of "project preparation" was shifted to INCRA. The owner was then no longer

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1/ The Land Statute classifies farms as minifundia, rural enterprises, latifundia by exploitation, and latifundia by size, depending on a series of indicators concerning location, size, land utilization and social conditions for workers. For a discussion of the coefficients used in this classification, see section on land taxation below.

2/ Note also that the owners engaged consulting firms to draw up their project. The consulting firms were generally already overburdened with other projects (including those of the IAA modernization program) and frequently delayed project preparation or submitted unfeasible proposals.

Table 12: LAND REFORM EXPERIENCE IN THE ZONA DA MATA, NORTHEAST BRAZIL

Program or project	Area (ha)	Number of families	Comments
Tiriri	4,443	290	Land reform experiment by SUDENE began in 1962. Later, INCRA expropriated land of Usina Salgada.
Rio Tinto	18,715	1,215	Land belonged to textile factory; occupied by squatters. Expropriated by IBRA in 1964.
Caxanga	19,000	720	Usina Caxanga expropriated in 1966 following worker unrest due to delays in salary payments. Administered by IBRA, then INCRA. Half of land is in large "cooperative" cane area for the Usina; remainder in parcels of 12.5 hectares, mostly planting sugar cane, diverse crops and raising animals.
GERAN	4,000	230	GERAN program was for modernization of sugar mills and cane production with land transfer to absorb labor displaced by increased productivity. Only one project actually carried out: "31 de Março" project on land of Usina Cacau (approximately 30,000 ha. total area on farm originally). Currently administered by SUDENE; likely to be transferred to INCRA.
PROTERRA	17,280	563	PROTERRA is the current land reform program. Purchase of unused land with agreement of owner. Program in initial phase. Figures include planned programs for 9,300 hectares already purchased being surveyed for transfer to parcel recipients.
Total	63,438	3,018	

responsible for preparing a detailed plan for use of the reform area. However, INCRA's own plans for the redistributed areas amounted to a "supervised credit" program for individual parcel recipients rather than integrated projects. 1/ This was probably a correct first step and in line with INCRA's limited administrative capacity, but it was considerably less than what is generally thought of as a "land reform" and certainly less than desirable to assure viability of farm operations. Much of the area which had been "liberated" (the INCRA terminology), was delivered. Owners were paid in cash with a land price either the lower of the evaluation by the Bank of Brazil, or the municipal average of the 1966 cadastral land value, brought up to date by monetary correction and increased still further by 50% (apparently in recognition of the undervaluation in declarations for tax purposes). The landowners generally were happy with the price received since the land transferred tended to be of somewhat lower quality than their average land (although INCRA negotiated with owners to avoid taking only poor land).

PROTERRA Land Reform Action to Date

67. The total land purchased under PROTERRA to date has been 17,000 hectares, or about 1-1/2% of total farm area in the Zona da Mata "priority" area of Pernambuco. Less than half of this area has been transferred to recipient families; the remainder is being surveyed for transfer. Approximately 600 families will be settled on this land. For purposes of comparison, the total "reform sector" under PROTERRA to date represents approximately the same area and somewhat have fewer families than the single farm Caxanga expropriated in the mid-1960s. Although action under PROTERRA has been quited limited, it does represent a concrete beginning.

68. Distribution of land under PROTERRA expropriations has tended to be in larger parcels than in past land reform experiments. Thus, the 60-hectare parcel average under PROTERRA (excluding the horticultural area near Recife) far exceeds the 12-hectare parcel on Caxanga. Moreover, plans are to divide most recent expropriation, Usina Agua Branca, into plots of over 100 hectares. Production of sugarcane and/or other crops on the larger parcels necessitate hiring of large numbers of salaried laborers to supplement family labor on the parcels. (Even in the case of Caxanga, settlers need to hire as many as ten workers during the peak season.)

69. The tendency toward larger parcels reflects thinking among INCRA technicians that the best way to succeed in a land reform project is to establish medium-sized farms. These would be run by entrepreneurs with better

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1/ In August 1974, the Minister of Agriculture signed a resolution extending by 90 days the deadline for landowners in priority land reform areas to adhere to INCRA's program. It also transferred formally to INCRA the responsibility for elaboration of project in the reformed areas. This resolution also requires the landowners to provide an account of all renters, tenants and occupants on their lands, to prevent that all of them are transferred into the areas to be released, as it had been happening, creating problems of minifundia.

Table 13: STATUS OF LAND REDISTRIBUTION UNDER PROTERRA, ZONA DA MATA, NORTHEAST: END OF 1973

Farm	Area transferred (in ha)	Payment (Cr$1,000)	Families settled	(titled)
1. Farms acquired, surveyed and families already settled				
Usina Crauata	3,512	2,353	53	(30)
Usina Frei Caneca (Eng. Oratorio)	744	141 (44)/1	11	(11)
Usina Central Barreiros	3,170	748(234)/1	26	(26)
Jose Morais Heracles (Eng. Riacho do Sul)	553	122 (73)/1	7	(7)
	7,980			
2. Acquired and being surveyed			(planned)	
Companhia de Tecido Paulista (Eng. Caiana e Novo)	937	562	280	
Usina Massaussu	884	282 (6)/1	10	
Cia Acucareira Santo Andre do Rio Una	991	208	90	
Usina Maria das Merces	1,950	829 (62)/1	40	
Usina Pedrosa	1,147	332 (22)/1	10	
Celso Lins de Oliveira	420	210	7	
Usina Agua Branca	3,291	896	29	
	9,299			
Subtotal	17,280	6,683(441)/1	563	
3. Areas to be acquired in immediate future				
Usina Tiuma	1,600 approx	n.a.	370 est.	
Usina Sao Jose	1,500 approx	n.a.	350 est.	
Usina Extrelina	n.a.	n.a.	n.a.	
Usina Alianca (Pessoa de Melo Ind. e Comer.)	n.a.	n.a.	n.a.	
Usina Santa Tereza (Agroindustria de Goiana)	359	n.a.	4 est.	
Eng. Itaperema do Meio (Armando de Sa Cavalcanti de Albuquerque)	600	n.a.	n.a.	

/1 Figure in parentheses refers to payments for buildings additional to payments for land shown in column.

than average managerial ability, would be of sufficient size to provide them with expectations of a satisfactory standard of living and would be sufficiently few in number to be manageable from the standpoint of INCRA technical assistance burden. While this would be an efficient way of running the program both from the point of view of utilization of INCRA staff and achieving production objectives, it does not have the balance between production and distribution considerations ordinarily expected in land reform programs. Of course, all the figures involved are of limited importance as long as the reform is restricted to its current dimensions. The parcel size issue would only take on major importance if PROTERRA expands its activity to a much larger area.

Prospects for Future PROTERRA Land Reform Action

70. The planned scope of future land redistribution under PROTERRA is unclear. However, the President of INCRA has stated publicly that a full 811,350 hectares in the Northeast could be expropriated from landowners who had failed to adhere to PROTERRA. This area would be in addition to 585,956 hectares already subject to transfer, placed at the disposition of PROTERRA by adhering land owners. Table 14 summarizes the apparent situation with regard to potential future scope of PROTERRA land redistribution as of April 1975. The full area subject to expropriation is 1.4 million hectares. This total includes the 811,350 hectares subject to involuntary expropriation by virtue of non-adherence of owners (category 3 in the table).

71. The economic significance of this potential area of expropriation may be appreciated by considering the number of families it could absorb. Calculations using the SUDENE/IBRD sample survey for the Northeast indicate that (after accounting for varying land quality as measured by land price) the total agricultural area per family, if land were equally divided among existing rural population, would be an average of 37 hectares in Ceara and 6.5 hectares in the Zona da Mata areas of Pernambuco and Paraiba. Therefore, if the entire area possible were expropriated and placed into family parcels of these sizes, approximately 88,000 families could be absorbed in land reform under the current provisions of PROTERRA. This number of families represents 220,000 workers, or approximately 5.7% of the agricultural labor force in the six core Northeastern states (Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe). The area involved would amount to 8.3% of total agricultural land in Ceara, 4.1% in Pernambuco and 2.8% in Paraiba. Considering the rich Zona da Mata land alone in Pernambuco and Paraiba, the area expropriated would constitute 28.3% and 31.6% of the total, respectively (see Tables 4 and 6). A land reform of these dimensions would clearly be a very significant beginning in reforming the agrarian structure.

72. Data recently provided by the SUDENE/IBRD farm survey provide a basis for calculating the potential economic effects of a land redistribution of these dimensions. Tables 15 and 16 present preliminary calculations of these effects. The estimates assume that the land reform parcels would have input-output characteristics currently found on farms of parcel size. The general results are that application of land reform on a modest family parcel basis to the full 1.4 million hectares listed in Table 14 could increase total

Table 14: PRESENT AND POSSIBLE LAND EXPROPRIATIONS UNDER PROTERRA

(In hectares)

	Ceara	Pernambuco	Paraiba	Total
1. Area already expropriated by INCRA	128,000	17,279	-	145,279
2. Area placed by owners at disposition of PROTERRA for expropriation (adherents)	373,677	67,000	-	440,677
3. Area subject to expropriation on lands of latifundio not adhering to PROTERRA	500,000	183,463	127,887 1/	811,350 1/
Total	1,001,677	267,742	127,887	1,397,306

1/ Estimate based on statement to press by President of INCRA, April 15, 1975 that 811,350 hectares were subject to expropriation due to the non-adherence of owners to PROTERRA program.

Source: SUDENE

agricultural production in the Northeast by $148 million annually (in 1973 dollars) at an investment cost of $168 million for increased capital in animals, buildings and equipment (plus a similar magnitude of pure transfer in terms of land cost). The implied capital/output and capital/job ratios are exceedingly favorable, suggesting that a land reform implementing the full current scope of PROTERRA would have attractive characteristics from the project investment standpoint as well as from the standpoint of social objectives.

73. To date, PROTERRA land redistribution has been very limited. However, even continuation of a much more restricted program (for example, confined to the 600,000 hectares already placed at the disposition of PROTERRA by "adhering" landowners) would be far preferable to total paralysis of land redistribution in the Northeast. Accomplishments in a limited land reform could dispel the strong prejudice against the such programs based on the belief that they create a stagnant small-farm structure. Successful experience in such a land reform could also act as an element of increased pressure on landlords to utilize their available land more fully and could lead to future extension of land reform to areas presently exempt under existing regulations. In view of the importance of the role that even a limited land reform program could play in the Northeast, international agencies might well consider supporting such land reform efforts by providing technical and financial assistance for strengthening the administrative structure and for the provision of infrastructure, inputs and other services required by the beneficiaries of the program, probably within the context of integrated rural development projects. Such support could be even more important in facilitating the implementation of land redistribution over the full potential area of 1.4 million hectares under the PROTERRA program.

C. Land Purchase Financing

The Bank of Brazil PROTERRA Land Credit

74. The provision of financing for land transfers has been used in the Brazilian context to stimulate land redistribution through the market mechanism. The small-farmer activities of the Bank of Brazil (see Chapter V) include a land purchase credit program financed with PROTERRA funds which, in contrast to the rest of PROTERRA credit, has attempted to limit financing to small-size plots and small farmers. Interest is 12% in nominal terms, without monetary correction, and the loan is repayable in twelve years, with two years grace; financing is limited to 80% of the purchase price. Credit is directed toward small- and medium-sized acquisitions. Purchases may be no larger than six INCRA modules. 1/ The purchaser must live on the property and may finance the acquisition of land adjacent to a property he already works and/or owns. If he was previously not associated with the purchased

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1/ A module is the amount of land necessary to generate a farm income of four minimum salaries as defined by INCRA. The size of the module varies from about 3 to 120 hectares depending on the region and type of product produced.

Table 15: PROSPECTIVE ECONOMIC EFFECTS OF MAXIMUM LAND REFORM UNDER PROTERRA

(In millions of 1973 U.S. dollars)

	Ceara	Pernambuco & Paraiba	Total
Land transferred (1,000 hectares)	1,001.7	395.6	1,397.3
Value of land expropriations:			
at average price of zone (SUDENE/IBRD)	52.0	115.8	167.7
at average price of expropriations already made by INCRA (SUDENE report)	18.0	27.3	45.3
Size of land reform parcel (hectares)	37	6.5	...
Number of parcels (and families)	27,072	60,866	87,938
Increase in economic activity, reform sector:			
Production	34.6	133.0	167.7
Employment (man-years)	67,680	152,165	219,845
Capital: buildings & constructions	49.8	19.4	69.2
equipment	4.3	14.0	18.4
animals	38.8	94.0	132.8
Purchased inputs	2.2	40.9	43.2
Decrease in economic activity, expropriated latifundia			
Production	13.0	6.3	19.4
Employment (man-years)	9,316	1,701	11,017
Capital: building & construction	18.8	6.2	25.1
equipment	2.3	.3	2.6
animals	19.3	5.1	24.5
Purchased inputs	.7	.7	1.4
Net Economic Effect			
Production	21.6	126.7	148.3
Employment (man-years)	58,364	150,464	208,828
Capital: buildings & constructions	30.9	13.2	44.1
equipment	2.0	13.7	15.7
animals	19.4	88.9	108.3
Purchased inputs	1.5	40.2	41.8
Incremental gross capital/output ratio	2.42	.91	1.13
Capital Investment	52.4	115.7	168.1

Source: Calculated from data provided by SUDENE/IBRD farm survey.

Table 16: INCREASE IN AGRICULTURAL PRODUCTION THROUGH MAXIMUM PROTERRA LAND REFORM, COMPARED TO CURRENT OUTPUT

Zone /1	1973 Production (million dollars)	Increase through land redistribution	Percentage increase over current output /2
C (Sertão)	540.8	21.6	4%
E (Humid East)	73.9	126.7	171.4%

Source: Current output based on expansion of SUDENE/IBRD survey.

/1 See Table 9.

/2 See Table 15.

land, he must move there with his family and work the land directly. Some of the land-credit purchasers have been sharecroppers and tenant farmers acquiring the land they were working; others have been some members of a family buying out the others, in cases where land was divided among the owner's children upon death.

75. Unlike the modern input and investment credit programs of PROTERRA, the land credit facility is based completely on on-lent funds rather than on refinancing or on the resources of the financial agent itself. Onlending is not financed out of Central Bank funds, but out of tax revenues allocated to the Ministry of Agriculture for the PROTERRA program, and then channeled to the financial agent through the Central Bank. The PROTERRA allocation to the Ministry of Agriculture has been divided between land credit, INCRA funds, and other Ministry of Agriculture programs. In 1973, this allocation was Cr$ 270 million -- 90 for the Ministry of Agriculture, 120 for INCRA and 6.0 for land credit. The proposed 1974 allocation raises the Ministry of Agriculture share to more than half and divides the rest equally between INCRA and land credit.

76. Land loans accounted for 7% of PROTERRA lending in 1971, 9% in 1972, and 3% in 1973. The small share of funds devoted to this form of credit and its abrupt decrease in 1973 results from several problems in the design and execution of the program. Despite these problems, discussed below, the program has financed the sale of 303,000 hectares in the three years of its existence (Table 17). This compares quite favorably to the land-transfer program of INCRA in the sugar zone, which during the same period expropriated one-twentieth that amount of land -- less than half of which has been transferred to settlers.

77. Though demand for PROTERRA land credit funds has been considerable, the program has become unpopular with its financial agents partly because the arrears rate was in some cases higher than usual. 1/ This problem is a result of loan terms that are too hard for those without easy access to institutional credit -- such as sharecroppers and tenants buying the land they work. In particular, the 20% down payment is considered a severe obstacle for poor buyers. These terms are harder than those available on other long-term PROTERRA credit. For example, PROTERRA financing for fixed capital investment is available for a 12-year period, but at 7% interest with 6 years grace and for 100% of the value of the investment. 2/ INCRA land recipients

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1/ Land credit was unpopular with the Bank of Northeast and Bank of the Amazon from the start. The Central Bank allocated the BNB Cr$30 million in 1972 for land credit; the BNB subsequently requested that all but Cr$6 million of that amount be transferred to its allocation for PROTERRA agricultural credit, which was done. Similarly, BASA received a Cr$15 million allocation for land credit, which was subsequently transferred, at its request to agricultural credit.

2/ Up to a value of 5,000 times the minimum wage, well above the average loan size for land credit. Minimum wage in 1972 was Cr$268.80; 5,000 times the minimum wage is Cr$1,344,000; the average land credit loan was Cr$23,400 in 1972 constant cruzeiros.

Table 17: BANK OF BRAZIL PROTERRA LAND CREDIT BY STATE 1971-73/1

States	Value (Cr$ million)	% total value	No. of loans	Average loan (Cr$1,000)	Total area financed (1,000 ha)	% total area	Value per hectare/2 (Cr$)	Average size per purchase (ha)
Ceará	20.7	17.3	954	21.7	74.9	24.7	276.3	78.5
Rio Grande do Norte	8.2	6.9	1,498	5.5	45.9	15.1	178.7	30.6
Paraiba	18.1	15.1	471	38.4	36.2	12.0	499.4	77.0
Pernambuco	37.7	31.5	1,238	30.5	57.3	18.9	658.5	46.2
Alagoas	9.2	7.7	177	52.0	16.3	5.4	565.3	91.9
Sergipe	5.4	4.5	105	51.4	9.0	3.0	597.5	86.1
Bahia	16.5	13.8	295	55.9	22.5	7.4	734.7	76.1
Maranhão	1.8	1.5	147	12.2	20.9	6.9	85.9	142.4
Piaui	1.9	1.6	223	8.5	20.8	6.8	91.5	93.2
Total	119.5	100.0	5,108	23.4	303.8	100.0	393.4	59.5

/1 All figures are totals of 1971, 1972 and 1973 data. Value figures were deflated by FGV index of prices received by farmers. In that land price increases were greater during this period than those of the price index, the constant figures may be inaccurate. The base year, 1972, however, showed the greatest number of hectares transferred, and 1971 and 1973 showed approximately equal numbers of hectares so that the 1971 and 1973 biases may cancel out.

/2 Represents 80% of sale value.

Source: Based on data from Bank of Brazil, Rural Credit Department.

pay less interest (7%) and no down payment, although the repayment period is two years shorter.

78. The Bank of Brazil has found that many land-buying sharecroppers have been forced to borrow the 20% down payment from the landowner, at very high interest rates for a short period. The sharecropper-buyer was subsequently often unable to meet his bank interest payments during the two-year grace period, because of the necessity to pay the landowner. 1/ Some Bank of Brazil branch managers have reacted to this problem by imposing conditions that have prevented the participation of the landowner in the down payment, and by exercising closer scrutiny over prospective borrowers to reduce the risk of default. As a result, lower-income buyers have been increasingly unable to qualify for the credit. Many Bank of Brazil managers feel that if the program had financed 100% of the purchase price, buyers would have been capable of amortizing the loan. Finally, the land credit program was not backed by a guarantee fund in the Central Bank which made bank managers even more wary and reluctant to promote it. 2/

79. Another cause of the slow movement of land credit funds has been the fact that there have been delays in channeling land credit fund allocations to the Central Bank. For instance, financial agents were not reimbursed for their 1972 land lending until November 1973, and for their 1973 lending, until June 1974. The financial agents were out of pocket on these funds for a considerable length of time and were reluctant to make further commitments. Had PROTERRA land credit been disbursed directly from the Central Bank like the other PROTERRA credit programs, this would not have occurred.

80. Data on purchasers under the land credit program are not available, although the Bank of Brazil states that the majority of sales was made to sharecroppers, tenants and rural workers. The average size of purchase under this program has been about 60 hectares (Table 17), which is about the size currently being used by INCRA for land parcels in the humid sugar zone. Most of the sales, however, have taken place in the Agreste and the Sertao. In the latter, 60 hectares would tend to be a small farm; in the former, a medium-size one. In some areas, particularly in the state of Rio

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1/ One Bank of Brazil agency in the Agreste of Pernambuco had made 25 PROTERRA land credit loans; by June 1974, all were in arrears.

2/ The Bank of Brazil branch is rated according to the arrears rate of its portfolio, the number and value of loans, the volume of deposits, the volume of tax collection, and services offered. This rating, in turn, determines the branch manager's salary and the classification of his branch. The higher the classification, for example, the higher the loan amount that can be decided upon at the branch level without approval of headquarters.

Grande do Norte, there has been substantial interest by landlords in making such financed sales to their sharecroppers. The average loan size and parcel size for that state seem to confirm this impression since they are substantially smaller than in the other states. The problem of the land credit program does not appear to have been lack of willingness of landowners to sell nor the farming capabilities of the buyer, but rather the design of the program.

Land Credit and Land Prices

81. When a financing mechanism for land transfer is introduced in a region, there is always the danger of driving up the price of land. The land price data for the Northeast do not show an unusual increase during the period of PROTERRA land credits, despite the fact that the 303,000 hectares financed amount to 3% of the cropped land in the region, and there was no other land financing mechanism in operation at the time (Table 18). During the 1971-73 period, the percentage increase in Northeast land prices was less than one-half that for all Brazil. If there had been any land credit-caused price increases in the Northeast, they would be most likely to have shown up in the state of Rio Grande do Norte, which is one of the smallest states in the Northeast and accounts for the third largest number of hectares transferred under the PROTERRA program, an area representing 6% of the cropped land in the state. Rio Grande do Norte, however, does not exhibit above average price increases. The land price data, in sum, do not show an abnormally large land price increase during the period of PROTERRA credit. This, nevertheless, may not be direct evidence of the absence of a price impact of PROTERRA land credit, for prices might have increased even less without it.

Table 18: PERCENTAGE INCREASES IN LAND PRICES IN SELECTED NORTHEAST STATES AND BRAZIL, 1969-73 /1

States	Crop land		Pasture land		Scrub land (campos)	
	1969-71	1971-73	1969-71	1971-73	1969-71	1971-73
Ceara	18.6	42.0	11.2	36.4	23.2	27.0
Rio Grande do Norte	19.8	54.3	36.9	58.1	18.9	26.2
Paraiba	31.1	70.4	50.0	68.1	35.1	76.5
Pernambuco	12.6	31.0	22.1	24.5	9.1	31.4
Bahia	9.2	101.5	19.9	61.6	36.9	48.6
Brazil	45.1	140.2	47.3	138.2	53.6	201.6

/1 Percentage figures are for the two years of each time interval.

Source: Based on price per hectare data from "Agropecuaria -- Precos das Terras, do Trabalho e dos Servicos," Conjuntura Economica, June 1974, pp. 42-62.

82. Development of an equitable method for establishing price of land is clearly a key element in a land purchase scheme. An adequate price determina-

tion formula and a strong institutional framework will have to be worked out to minimize the problem of pricing of land parcels. Such a formula could draw on experience with PROTERRA land credit sales and expropriation. A price formula might be based on a version of the INCRA compensation formula for expropriated lands which seems to have gained acceptance with landowners. The Bank of Brazil might be particularly suited for playing an important role in the pricing process. In its experience with land price determination for PROTERRA expropriations and land loans, Bank of Brazil branches often held out for lower prices than those asked by landowners, based on its evaluation of the lands's productivity and of prevailing prices. This suggests that the Bank of Brazil's self-interest as financier may have acted to a certain extent as a counterweight to the tendency of land credit to increase prices.

Land Credit Versus Land Reform

83. The inclusion in PROTERRA of a land credit program along with a land expropriation-and-colonization program permits a comparison of two different approaches to a similar problem. The major obstacles to the success of PROTERRA land reform have been the lack of political support of INCRA in the enforcement of land transfers under the agrarian reform legislation, and its understaffing and lack of technical capacity to select the beneficiaries and design and implement projects for the land to be transferred. In the land credit program, market forces substitute for the institutional skill and political commitment that the INCRA program needs. Although the land credit program was not limited to farmers without land title, its availability showed that many such buyers existed and could eventually purchase the land they were working. It also showed that the opportunity to sell under such terms elicited substantial landlord interest.

84. Judged by banking criteria, the land credit program has not been a great success. Delayed payments have caused bank managers to discourage the very kind of borrower demand that would further land-redistribution goals. However, the causes of the problems could be dealt with relatively easily and at a modest cost. Loan terms could be softened, with longer repayment periods and with interest rates comparable to those of the INCRA land distribution program. The 20% down payment is bound to be self-defeating because it forces purchasers without title to land to resort to high cost noninstitutional credit. Land credit arrears could be excluded from the calculations that go into the ratings of branch managers so that lending is not discouraged by the penalty that potential defaults represent their career ratings.

85. The main disadvantage of a land credit scheme, as a substitute for land reform is that probably very few landless farmers have the knowledge, bargaining position and resources to undertake these type of operations on their own, unless they are already relatively high in the income distribution. In addition, market purchases take place in an unplanned or random fashion which would make it extremely difficult to provide the accompanying infrastructure and complementary services needed to make the new small farmers viable. Thus, land credit would clearly be a less desirable alternative than

a large scale, well coordinated, and institutionally strong land reform program.

86. The attractiveness of the land credit scheme lies in the fact that at this particular moment, it seems capable of working in the Northeast, whereas the INCRA-type program does not. Some criticize a land credit program as the costly subsidization of a mere transfer of wealth. Yet, the present INCRA agrarian reform amounts to almost the same thing. INCRA land recipients must eventually pay for the land and landowners are compensated favorably in comparison with most agrarian reforms. Parcels in the new INCRA settlements are likely to be large or larger than the average transfer of land financed under the land credit. A land credit program, admittedly, falls far short of the ideals of orderly land transfer in an expropriation program. But it may be the only workable approach to land redistribution in a setting where, as in Brazil today, there is no strong political commitment to agrarian reform. Without this commitment, a land reform institute cannot go very far. To improve the prospects of success for small farmers, land credit might be associated with a technical assistance-credit program, which could be an obligatory aspect of the land purchase credit. This feature would give the program a productivity orientation and could also act as a device for selecting the type of farmer who would have greater chances of success. In brief, a land credit facility could be an important element in rural development programs, particularly in areas where there are land tenure problems and land reform is not feasible in the short-term.

87. A modification and strengthening of the land credit program need not exclude continuation of the INCRA program. Indeed, the INCRA program and the threat of expropriation is probably a significant factor in contributing to landlord interest in selling land in significant quantity and at reasonable price. Moreover, if the cattle-grazing alternative to labor and tenant problems (see Chapter V) were not as subsidized through the credit system as it presently is -- and if the land-selling alternative were -- then even more land for sale would probably be forthcoming. Thus, viewed as a complement to INCRA's limited land reform, the land credit program might be able to achieve the goals of agrarian reform to an extent that the present reform program could never be expected to do so, given the institutional and economic policy environment in which it is taking place.

D. Land Taxation

88. Land taxation is often considered as a possible alternative to land reform to improve land distribution structure and land productivity. Brazil's land tax stems from the 1964 Estatuto da Terra. In principle, it taxes large farms more heavily than smaller units and unutilized land more heavily than utilized land. The base of the tax is the unimproved land value (valor da terra nua) declared by the owner in the cadastral register. A cadastral survey was carried out in 1967 and a second in 1972. For intermediate years, INCRA, which administers the tax, has increased the land value by 6% annually (far below actual inflation).

89. The basic tax rate is 0.2% of land value. The rate is multiplied by the product of four factors:

(a) dimension coefficient, ranging from 1.0 to 4.5;

(b) location coefficient, ranging from 1.0 to 1.6;

(c) social conditions coefficient, ranging from .3 to 1.6; and

(d) productivity coefficient, ranging from .4 to 1.5.

Hence, the theoretical basic land tax (ITR: Imposto da Propriedade Territorial Rural) ranges from a minimum of 0.024% to a maximum of 3.456% of land value. On top of the basic ITR, there are proportional contributions to INCRA and to the national syndicates of farmers and agricultural laborers which raise the total land tax to approximately 5 times the basic ITR. The tax is collected by the local prefeitura (mayoralty). The prefeitura receives 80% of the basic ITR (a relatively small proportion of the total). INCRA technicians estimate that, for 1973, 70% of the land tax owed nationwide was in fact collected (excluding back debts owed on tax unpaid in previous years).

90. It appears that the land tax may have had some influence on the agrarian structure only in the Center-West and North where the sizes of properties are extremely large and thus the size coefficient becomes the most influential one in determining the tax burden. The principal effect of the land tax in these regions, however, seems to be that larger scale private settlement projects are split up and carried out in several still fairly large subunits, each of which would be subject to a lower tax rate than if they were considered jointly as a single project.

Table 19: LAND TAX "DIMENSION" COEFFICIENT

Farm size in "modules" /1	Dimension coefficient
1 and less	1.0
1 - 10	1.5
10 - 30	2.0
30 - 80	2.5
80 - 150	3.0
150 - 300	3.5
300 - 600	4.0
600 and over	4.5

/1 The "module" is defined as the amount of land in a given region and a given category of product necessary to generate farm income equivalent to four minimum salaries.

Source: INCRA Special Instruction No. 5, May 22, 1973.

91. The land tax, with its complicated procedure of calculating coefficients, has the disadvantage of being arbitrary. But at the same time, it has the strong advantage of being inflexible in its arbitrariness and thus unsusceptible to attempts of landowners to reclassify themselves into a lower tax category on the basis of subjective arguments to officials.

92. There are three basic problems with the land tax:

(a) the land value declared is below market value;

(b) the rate of land price inflation is such that land value declared is quickly outdated; and

(c) the basic rates themselves are low, although this point is less certain given a maximum value of the ITR of 3.5% of land value, and considering the fact that with total contributions (INCRA and syndicates), the tax is a multiple of as much as 5 times the basic ITR.

93. An estimate of the actual burden of the land tax and tax "emission" totals by state in 1973 shows that despite the fact that the theoretical maximum tax is over 17% aggregate, tax collections in 1973 amounted to only 0.56% of the "average" aggregate land value for the Northeastern states.

94. Land productively used sshould earn a return comparable to that on capital assets. If, for example, this rate of return were 15% per annum, the average tax rate 0.5% of land value would represent 3.33% of annual earnings from land. This would appear to be inadequate to influence decisions concerning land use and land sale. It is clear that the burden of the land tax is greater on poorly utilized land. If land generated a return of only 5%, for example, due to poor utilization, then the one-half of 1% tax rate would consume 10% of earnings from the land. The problem with this approach, however, is that landowners take into account capital gains from land price increases in their decisions. Hence, even land left wholly idle may have a very sizeable gain. According to the Vargas Foundation data, in the second semester of 1973, average land prices in all of Brazil were almost exactly double the level one year earlier. Since general price inflation was only 15% during the same period (according to official indices), landowners experienced on the average a real capital gain of 74% on their land holdings. In the face of this type of "rate of return" from mere portfolio asset holding, the existence of a land tax of one-half of 1% will be inconsequential with respect to land use decisions.

95. In view of the above, the most important improvement in land taxation would probably be a radical change in the intercadastral land tax valuation process. An equitable measure would be to apply an index of actual market values of land sales, such as that maintained by the Getulio Vargas Foundation. Further improvement could be achieved by tightening restrictions on underdeclaring land value in the first instance, by continuing the effort to raise tax collections to 100% of tax due. Despite the desirability of such

Table 20: LAND TAX COMPARED TO LAND VALUE BY STATES, BRAZIL 1973

States	Land tax Cr$ mil.	Farm area 1,000 ha (cadastro)	Land value estimates/1 High	Low	Average	Tax burden Low	High	Average
			Cr$ million			Percentage		
	A	B	C	D	E	F	G	H
Acre	2.6	6,978	4,187	2,903	3,705	.062	.089	.070
Amazonas	3.8	8,333	6,275	2,966	4,216	.061	.128	.090
Para	11.6	21,781	10,760	4,661	6,643	.108	.249	.175
Maranhão	12.9	23,560	5,843	919	3,463	.221	1.404	.372
Ceará	15.5	12,468	3,117	1,571	2,232	.497	.987	.694
R.G. do Norte	7.0	4,665	1,712	793	1,162	.409	.883	.602
Paraiba	10.5	4,983	2,970	1,884	2,472	.354	.557	.425
Pernambuco	16.5	6,428	3,310	2,089	2,745	.498	.790	.601
Alagoas	5.9	2,176	1,258	912	1,136	.469	.647	.519
Sergipe	6.1	2,055	1,245	919	1,200	.490	.664	.508
Bahia	36.0	28,027	22,702	9,277	17,012	.159	.388	.212
Minas Gerais	106.1	44,323	60,545	23,137	43,614	.175	.459	.243
Espirito Santo	11.8	3,930	3,910	2,287	3,462	.302	.516	.341
Rio de Janeiro	18.8	3,822	5,137	3,745	4,480	.366	.502	.420
Parana	89.9	19,121	36,942	23,939	30,938	.243	.376	.291
Sao Paulo/2	106.6	23,197	44,817	29,043	37,533	.238	.367	.284
Santa Catarina	26.8	8,350	11,565	10,471	10,989	.232	.256	.244
R. G. do Sul	83.5	25,142	45,809	35,752	40,730	.182	.234	.205
Mato Grosso	52.8	87,868	83,387	27,678	63,616	.063	.191	.083
Goias	44.5	48,095	47,277	17,410	36,889	.094	.256	.121
Total/3	669.2	385,302	402,768	202,356	318,237	.166	.331	.210

/1 Land value estimates based on Fundacão Getulio Vargas land sale price data, Table 21. Column C=Column B times highest of three prices listed in Table 21; Column D= Column B times lowest; Column E=Column B times simple average of the three prices.

/2 São Paulo land value estimated using prices for Parana.

/3 Brazil, excluding Amapa, Distrito Federal, Guanabara, Piaui, Rondonia, Roraima. Land Tax data: INCRA-Brasilia; represents total land tax charges, including ITR, contribution to INCRA and contributions to rural Sindicatos. Actual tax collection: estimated to be 70% of tax value charged.

Table 21: LAND SALE PRICES: 1973 AVERAGES

(Cr$ per hectare)

States	Cropland	"Campos"	Pasture	Average
Acre	578	416	600	531
Amazonas	408	356	753	506
Para	208	214	494	305
Maranhao	155	39	248	147
Ceara	250	126	162	179
R. G. do Norte	367	170	210	249
Paraiba	596	378	515	496
Pernambuco	442	325	515	427
Alagoas	578	419	568	522
Sergipe	606	447	699	584
Bahia	680	331	810	607
Minas Gerais	1,366	522	1,065	984
Espirito Santo	995	582	897	881
Rio de Janeiro	1,307	953	1,161	1,140
Parana	1,932	1,252	1,669	1,618
Santa Catarina	1,385	1,254	1,309	1,316
Rio Grande do Sul	1,822	1,422	1,615	1,620
Mato Grosso	949	315	924	729
Goias	983	362	956	767
Distrito Federal	498	169	450	372

Source: Fundação Getulio Vargas, Centro de Estudos Agricolas.
Figures given here are averages of the basic data which refer to first and second semesters of 1973.

reform in the land tax, these revisions would probably not make the land tax an adequate substitute for agrarian reform in bringing about a significant improvement in land distribution and land tenure. It is popular to turn to land taxation to avoid the political consequences of land reform, but the fact is that in most countries with serious land distribution problems, land tax burdens are trivial and have hardly any influence on land use. Although there are important enforcement problems in land taxation, the main reason for lack of action is probably that where political forces will not support land reform, the political context is also unlikely to be receptive to stiffer land taxation. 1/

1/ See for example G. Sazama, and H. Davis, "Land Taxation and Land Reform," Economic Development and Cultural Change, 21 (4, Part 1), July 1973, pp. 642-654.

IV. AGRICULTURAL TECHNOLOGY AND SMALL-FARMER PRODUCTIVITY

A. "Traditional" Versus "Modern" Technology

Sources of Past Agricultural Growth

96. An analysis of the factors that have influenced the expansion of Northeast agricultural output (area, yield and change in value of product), indicate that the principal source of growth over the last 20 years has been an expansion in cultivated area. Average yields have increased slightly, concurrently with a shift to lower valued products (see Table 22). 1/ Although the rate of expansion in cultivated areas varied among the different states during the two decades -- all of the states exhibited the same general trend. Only in the state of Pernambuco, in the sugar growing zone, was an increase in yield of any significance as a source of growth, accounting for somewhat less than one-third of the 4.1 average annual growth rate of output. Of the nine states which constitute the Northeast region, five actually experienced declining yields over the period. The substitution of lower valued products -- beans, maize, rice -- for higher valued products -- coconut, coffee, tobacco, sugarcane -- in the Northeast region over the period had a negative impact on growth of 16.1%. This shift can be attributed primarily to higher relative prices for the lower valued products particularly during the late 1950s and early 1960s. 2/

97. The behavior of agricultural output and the sources of its growth raise certain questions which are important to analysis of agricultural policy:

(a) Why has an expansion in cultivated area been the primary source of growth in agricultural production?

(b) Why have farmers not undertaken new practices and adopted yield increasing technology in preference to expanding cultivated area?

(c) What may be concluded regarding the possibility of initiating rural development programs to improve the productivity of large numbers of small-scale farmers in the Northeast based on adoption of modern agricultural technology?

1/ George F. Patrick, Desenvolvimento Agricola do Nordeste, IPEA, No. 11, 1972.

2/ Patrick, Ibid., p. 61, Table 7.

Table 22: SOURCES OF GROWTH IN AGRICULTURAL PRODUCT IN THE NORTHEAST

(Percent)

States	Number of crops	1948-50/1959-61 /1 Annual rate of growth	Source of growth			1959-61/1967-69 /1 Annual rate of growth	Source of growth			1949-50/1967-69 /1 Annual rate of growth	Source of growth		
			Area	Yield	Change in product		Area	Yield	Change in product		Area	Yield	Change in product
Maranhao	17	10.9	82.6	11.8	5.6	6.6	104.4	-12.3	7.9	9.6	87.3	5.0	7.7
Piaui	16	5.4	139.1	-13.2	-25.9	7.6	136.6	-18.3	-18.2	6.6	153.2	-18.3	-34.9
Ceara	18	3.0	110.0	- 6.1	- 3.9	8.8	103.3	-11.3	7.9	5.4	107.1	-13.8	6.7
Rio Grande do Norte	17	3.7	83.8	34.3	-18.1	5.9	91.0	-21.9	30.9	4.6	85.3	4.1	10.7
Paraiba	18	3.3	92.1	19.5	-11.6	2.9	133.5	-27.1	- 6.4	3.1	110.0	1.8	-11.8
Pernambuco	18	4.4	107.2	3.0	-10.2	3.7	64.7	57.2	-21.9	4.1	87.9	31.1	-19.0
Alagoas	18	4.5	98.1	- 9.8	11.7	3.4	59.1	9.9	31.0	4.0	80.7	- 2.3	21.6
Sergipe	18	4.3	108.5	4.7	-13.3	5.2	114.7	- 4.4	10.4	4.7	114.2	- 1.6	-12.6
Bahia	19	2.6	193.4	-72.1	-21.3	5.0	76.2	51.4	-27.6	3.6	131.3	- 0.5	-30.9
Northeast	19	3.8	118.8	-10.9	- 8.0	5.5	100.7	15.6	-16.4	4.5	112.1	4.0	-16.1

/1 In 1968 constant cruzeiros.

Source: IBGE Anuario Estatistico do Brasil, Rio de Janeiro. See George F. Patrick, Desenvolvimento Agricola do Nordeste, IPEA, 1972, p. 75, for the methodology used in separating the sources of growth.

In analyzing these questions, the focus will be on small-holder agriculture and will exclude the Zona da Mata, as this region generally receives sufficient rainfall to grow sugarcane or other high moisture requirement crops and is not as subject to the severe climatic limitations and high risk agriculture of areas such as the Agreste or Sertao where rainfall is lower and extremely variable.

Availability of and Motivation for Adoption of New Technology

98. The fact that most of the increase in output is the result of increased use of land reflects an almost total absence of relevant agricultural research and demonstration trials and results which could be transferred to small-scale producers. Most crop research on varieties, planting dates, fertilization, etc., has been conducted without concurrent economic analysis. As a result, economically sound, well-defined technological packages combining traditional and non-traditional practices adapted to specific microclimates, are generally not available, except for limited areas and products. Little work has been undertaken in the Northeast in developing improved seed varieties adapted to the extremely variable climatic and ecological conditions encountered in the region. Consequently, while the few available improved varieties generally perform well when adequate fertility and moisture are available, when rainfall is inadequate, yields are greatly affected, often reaching lower levels than obtained with unimproved varieties under drought conditions. There is a particular lack of data and technical recommendations pertinent to crops cultivated in association (i.e., cotton interplanted with corn and beans) which is a basic characteristic of small-scale farming in the Northeast.

99. Another obstacle to generating and delivering profitable technological packages is that the technical assistance agencies are not accustomed to making their recommendations on the basis of farm budgets. Their work programs are crop-oriented, primarily in terms of technical factors, that is, correct soil preparation, correct planting practices, use of improved seeds, use of fertilizer, use of machinery, etc. This is a necessary prerequisite for improving yields and productivity, but does not show the profitability of the recommended practices or their effect on net farm income from all operations, which is the primary interest of the farmer.

100. Agricultural research has generally ignored the influence of risk and uncertainty in the adoption of new technology, a key factor in Northeast agriculture. Agriculture in the more drought-prone interior zone of the

Northeast involves a considerable degree of uncertainty. 1/ This uncertainty leads farmers, particularly small ones, to prefer production strategies which minimize the risks from poor weather, rejecting other combinations of techniques and crops which would yield greater benefits in the short run, albeit with greater risk of loss from drought. This is particularly critical where use of credit is necessary for purchasing fertilizers, insecticides and improved seeds. 2/ The risk associated with crop failure in high-input/ high-output agriculture is much larger than in traditional practices which do not require the farmer to make large cash outlays or acquire large debt.

Profitability of New Technology under Northeast Conditions

101. Generalized farm budgets have been prepared to demonstrate the effects of changes in technology on net income and the returns to labor and

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1/ Beck has examined the limitations of rainfall cropping in the Northeast using criteria developed by various Northeast agricultural research scientists which indicate that the minimum water requirements for beans, in order to assure normal plant development, maturity and yields, were 100 millimeters of rainfall for three consecutive months. On the basis of examining rainfall patterns covering a 20-year period for 634 rain guage stations spread throughout the Northeast, he found that only the Zona da Mata met the above requirements more than 90% of the 20 years, reasoning that "It is doubtful if a farmer can afford to lose as many as one crop in ten (through crop failure) and stay in business and make a satisfactory living." See Roy S. Beck, "Growing Season Requirements of Rainfall for Cultivated Crops Such as Dry Beans in Northeast Brazil and Number of Years in Twenty that Such Requirements were Met in Various Municipios," USAID, Recife, 1970.

2/ Various studies indicate that research on new seed varieties in the Brazilian Northeast has not turned out improved seeds which present increasing returns to fertilizer applications under conditions of uncertain availability of water. Nor are the short-term prospects favorable for developing improved varieties with these characteristics. See John H. Sanders, et. al., Inovacoes Technologicas e Riscos em Pequenas Empresas do Sertao Central-Estado de Ceara, Department of Agriculture Economics, Federal University of Ceara, 1974; and Kenneth D. Frederick, Agricultural Development in the Brazilian Northeast, California Institute of Technology, December 1970.

land for the production of four crops: beans, maize, rice and cotton, plus combinations of beans and maize and beans and cotton. Production costs resulting from traditional practices are shown on Table 23. 1/

1/ It should be noted that the data in Table 23 and 24 are not drawn directly from agricultural research and demonstration trials structured in accord with operating conditions encountered at the farm level to permit concurrent economic analysis of the experiments in cohort with the physical results. The more important implication is that any expanded rural development program which is to be based on modern or improved technology which requires significantly increased capital outlays will contain a very high risk level until research trials on varieties, planting dates, fertilization, mulching practices, have been conducted under controlled small-farmer conditions simultaneous with economic analysis of the new practices.

Table 23: PRODUCTION COSTS WITH TRADITIONAL TECHNIQUES

	Beans/1	Maize/1	Rice/1	Cotton/1	Beans and maize/1	Beans and cotton/1
Labor requirements (man days)/2						
Soil preparation/3	13	13	13	13	13	13
Planting	10	7	17	10	12	15
Cultivation	22	22	40	30	25	30
Harvesting	17	21	21	10	28	25
Total man days	62	63	94	63	78	83
	(1974 current cruzeiros)					
Non-labor inputs						
Seed/4	100.50	7.20	56.00	16.25	107.00	116.00
Tools	10.50	10.50	10.50	10.50	10.50	10.50
Sacks/5	24.00	32.00	55.00	24.00	47.20	33.60
Total direct operating costs	135.00	49.70	121.50	50.70	164.70	160.10

/1 Yield levels (kg/ha): Beans-600 kg., maize-800 kg., rice-1,377 kg., cotton-511 kg., interplanted beans-480 kg., maize-700 kg., interplanted beans-400 kg., cotton-408 kg.

/2 Based on various studies of SUDENE, IPEANE and the state secretaries of agriculture.

/3 After initial land clearing.

/4 Seed: Beans-67 kg. @ Cr$1.50 = Cr$100.50; maize-12 kg. @ Cr$0.60 = Cr$7.20; rice-70 kg. @ Cr$0.80 = Cr$56.00; cotton-32.5 kg. @ Cr$0.50 = Cr$16.25.

/5 Sacks: Cr$2.40 ea/60 kg. bag.

Source: Kenneth D. Frederick, Agricultural Development in the Brazilian Northeast, California Institute of Technology, Dec. 1970, Servico do Informacoes do Mercado, Abril 1974 for Maranhao, Ceara and mission estimates.

Table 24: ESTIMATED PRODUCTION COSTS FOR "MODERN" TECHNOLOGY

	Beans			Maize			Rice	Cotton	Beans & maize	Beans & cotton
	(1)	(2)	(3)	(1)	(2)	(3)				
I. Yield (kg/ha)[/1]	810	1,000	2,000	1,120	2,650	4,200	2,244	733	600/910	580/622
II. Labor requirements (man days)										
(A) With traditional techniques	62	62	62	63	63	63	94	63	78	83
(B) Additional labor with with modern technology[/2]										
1) Soil Preparation	6	8	8	6	8	8	8	6	6	6
2) Planting	2	2	2	2	2	2	2	2	2	2
3) Cultivation and weeding	5	7	7	5	7	,7	6	6	5	5
4) Fertilizer and insecticide application	8	10	15	8	10	15	8	8	8	8
5) Harvesting	4	8	27	6	50	68	7	3	5	7
(C) Total (man days)	87	97	121	90	140	163	125	88	104	110
III. Non-labor inputs										
(A) With traditional techniques	Cr$135.00	135.00	135.00	49.70	49.70	49.70	121.50	50.75	164.70	160.10
(B) Increment in costs with "modern" technology										
1) Seed[/3]	123.95	123.95	123.95	22.68	25.20	28.00	187.00	36.00	145.00	310.00
2) Insecticides	24.00	48.00	48.00	28.00	47.00	47.00	180.00	171.50	48.00	171.50
3) Sacks	32.40	40.00	80.00	44.80	106.00	168.00	90.00	40.00	60.40	63.00
4) Tools	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
5) Fertilizers	536.00	536.00	1,334.40	1,000.00	1,320.00	1,908.00	720.00	800.00	499.00	510.00
Total direct operating costs	728.85	760.45	1,598.85	1,107.98	1,510.70	2,163.50	1,189.50	1,060.00	764.90	1,067.00

/1 c.f. Kenneth D. Frederick, Agricultural Development in the Brazilian Northeast, California Institute of Technology, Dec. 1970. The yield estimates for (1) are from the above cited study and comparisons made with various experimental trials conducted by ANDA, SUDENE and IPEANE at diverse locations in the Northeast primarily in Ceara, Pernambuco and Maranhao. The yields and associated data for beans and maize are based on experimental trials conducted by SUDENE in Ceara and Pernambuco. The data shown in the (3) columns represents the better, but not the most optimistic results obtained on experiment station trials. The mixed cropping yields have been adjusted to reflect yield reductions of about 25% because of the competition for sunlight and soil and water nutrients. Cotton is shown as seed cotton with a .35 conversion rate to lint.

/2 This assumes maintenance of labor intensive practices and utilization of improved seed, fertilizers, cultivation, etc., but does not include adopting mechanical planters, cultivators, etc.

/3 The increments shown are for improved seed, including treatment as follows: Beans, 67 kg. @ Cr$1.85 = Cr$123.95; maize, 20 kg. x Cr$1.40 = Cr$28.00; rice, 170 kg. x Cr$1.10 = Cr$187.00; cotton, 40 kg. x Cr$.90 = Cr$36.00.

Labor requirements for beans, maize and cotton are quite similar with slightly more labor being required for the rice production, mainly as a result of cultivation, i.e., weeding requirements. While non-labor direct operating costs are low, they also reflect the relatively low per hectare yields normally obtained using traditional technology in the Northeast. 1/

102. Production costs for different levels of modern technology are shown in Table 24. The three levels of modern technology given for both beans and maize are designed to simulate the technical recommendations currently made by the state extension services. These recommendations reflect progressively higher levels of management, in that the higher yields are a function not only of the increased use of purchased inputs, but also of the quality of management available to utilize the inputs and to apply the various cultural practices skillfully and on a timely basis. Probably the weakest point of these packages are the levels of application of chemical fertilizer. The recommended economic levels of fertilizer represent the results of experimental trials conducted by the National Association for Fertilizer Use (ANDA), SUDENE, IPEANE and the University of Ceara, but they are not backed by sufficient fertilizer field trials. 2/ Recently, work has been initiated to determine the profitability of fertilizer utilization in the Northeast by ANDA and several other agencies. This work, now in its second year, is providing the first reliable information under commercial farming conditions for determining profitable fertilizer recommendations for different soil types throughout the Northeast. Any widespread application of the results of these studies will depend on:

(a) continuation and expansion of the geographic location of the trials to additional soil types;

1/ The basic information in these budgets regarding level of purchased inputs are supported by preliminary data from the SUDENE/IBRD Farm Survey for Rio Grande do Norte which reveals that equipment and machinery investments are low, irrespective of farm size, with an inventory value ranging from US$155 for units of less than ten hectares to US$1,230 for farms 500 hectares and larger. Purchased inputs, mainly insecticides, are also small, averaging only US$7 per farm per year for all farms, with most units using none.

2/ ANDA. Analisis Estadistico e Economico dos Ensaios Realizados no Ceara Pelo Centro de Ciencias Agrarias Atraves do Convenio ANDA/ BNB/UFC em 1973. Fortaleza, April, 1974.

(b) future evolution of relative prices of fertilizer and products; 1/

(c) improvement of marketing and transport facilities to ensure that reasonable cost fertilizer is available in the rural areas of the Northeast; 2/ and,

(d) availability of extension specialists to assist farmers in determining each year the economic level of fertilizer application. 3/

103. In addition to progressively higher fertilizer levels and corresponding increased yields, the data in Table 24 also include additional labor to accomplish the specific tasks related to the new technology. The labor increment rises by 95% for the highest bean yield, 158% for maize, mainly as a result of manual harvesting, with increases of 32 and 39% for rice and cotton, respectively. The comparative profitability of the budgets for the six crops or cropping combinations are shown in Table 25. These comparisons are made from the viewpoint of:

(a) total return to land and labor, relevant for a small landowner with insufficient land for full employment of his family labor;

(b) implied daily wage resulting from total man days required to produce the crop, pertinent for a small renter or sharecropper with access to additional land to fully occupy his available labor; and

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1/ Currently, fertilizer product price ratios are highly unfavorable as compared to those in the south of Brazil and to those in other countries where high-input/high-output technologies are prevalent. For example, in Ceara during April 1974, one kilogram of black beans at the farm level was equivalent in value to 0.75 kilogram of triple superphosphate (46% P_2O_5) whereas in New York state, where similar beans are grown, one kilogram of beans was equivalent to the cost of more than three kilograms of triple superphosphate (46% P_2O_5). Thus, other things being equal, a bean farmer in Ceara would need to obtain a fertilizer yield response three times that of the New York bean farmer -- or yields approaching the level (3) modern technology shown in Table 24 -- to be equally motivated to use fertilizer.

2/ The high relative cost of fertilizer is further illustrated in Table 24 (Item III (B) 5), where based on the preliminary ANDA experimental trials and their "optimal" fertilizer recommendations, the cost of supplementary fertilizer makes up from 73 to 83% of the non-labor direct operating costs in the case of beans and 87 to 90% for maize.

3/ In other words, the optimum proportioning of variable (fertilizer, etc.) inputs to fixed resources should undergo constant change in relation to relative prices if profits are to be maximized.

(c) implied return to land with the wage rate at Cr$10 a day (the most commonly reported rural wage), of concern to the larger farmer who must rely on substantial amounts of hired labor. 1/

104. The data presented in Table 25 indicate that there is a considerable risk of reduced returns associated with the modern technology as compared with traditional techniques for almost all of the products studied. For example, the data for beans show that the modern technology level (1) results in a 12% reduction in net return to labor and land as compared with traditional

BEANS

Modern technology	Direct operating costs ((% change)	Return to labor and land (% change)
(1)	440	-12
(2)	462	21
(3)	1,083	137

technology although direct operating costs increase more than fourfold. While the potential net returns from modern technology levels (2) and (3) are greater than those expected from the traditional technology, the producer faces operating costs four times higher in case (2) and ten times higher in case (3). The modest increments in net returns relative to large increases in direct operating costs associated with various levels of modern technology and the higher risk of indebtedness as a result of crop failure apply to other crops as well. These make it unlikely that farmers or sharecroppers with inadequate land for full-time farm employment would adopt modern technologies in preference to the widely used traditional techniques, particularly if they can find complementary off-farm employment opportunities for their surplus labor.

105. Similar results are obtained with respect to returns to labor and to land independently in the majority of the other cases examined in Table 25, indicating that, at present relative prices, most farmers, regardless of type of tenure and size of farm, would rationally opt to expand output using

1/ As indicated by Frederick, Ibid., P. III-4, these measures may not adequately weigh the effect of seasonal labor requirements as a result of the opportunity cost of labor being higher during peak labor requirement periods, i.e., cultivation and harvesting. However, for the crops shown, this does not seem to be a major limitation, with the exception of perennial cotton, since apart from weed control, where the cotton is not being grazed, work can be spread over the cropping period. Additional research work, e.g., time and motion type studies under closely controlled conditions are required for corroborating seasonal labor requirements for the tasks shown in Table 24.

Table 25: COMPARATIVE RETURNS FROM TRADITIONAL AND "MODERN" TECHNOLOGY

	Yield (kg/ha)	Price (Cr$/m.t.)	Income (Cr$/m.t.)	Less direct operating costs (Cr$/ha)	Return to labor and land (Cr$/ha)	Implied daily wage with land rental cost at Cr$140.00/ha /1	Implied return to land with wage rate @ Cr$10.00/day
I. Beans							
Traditional techniques	600	2,216.00	1,330.00	135.00	1,195.00	17.02	575.00
"Modern" technology							
(1)	800	2,216.00	1,772.80	728.85	1,043.95	10.39	173.00
(2)	1,000	2,216.00	2,216.00	760.45	1,455.55	13.56	485.00
(3)	2,000	2,216.00	4,432.00	1,598.85	2,833.15	22.26	1,623.15
II. Maize							
Traditional techniques	800	862.00	689.60	49.70	639.90	7.94	9.90
"Modern" technology							
(1)	1,120	862.00	965.44	1,107.98	(142.54) /2	(3.14) /2	(1,042.54) /2
(2)	2,650	862.00	2,284.30	1,510.70	773.60	4.53	(626.40) /2
(3)	4,200	862.00	3,620.40	2,163.50	1,456.90	8.08	(173.10) /2
III. Rice							
Traditional techniques	1,377	760.00	1,046.52	121.50	925.02	8.35	(14.98)
"Modern" technology	2,244	760.00	1,705.44	1,189.50	515.94	3.01	(734.06)
IV. Cotton							
Traditional techniques	511 /3	2,800.00	1,430.80	50.70	1,380.10	19.68	750.10
"Modern" technology	733 /3	2,800.00	2,052.40	1,060.00	992.40	9.69	112.40
V. Beans and maize							
Traditional techniques	480/700	2,216/862	1,667.08	164.70	1,502.38	17.47	722.38
"Modern" technology	600/910	2,216/862	2,114.02	764.90	1,349.12	11.63	309.12
VI. Beans and cotton							
Traditional techniques	400/408	2,216/2,800	2,028.80	160.10	1,868.70	20.83	1,038.70
"Modern" technology	580/622	2,216/2,800	3,026.88	1,067.00	1,959.88	16.54	859.88

/1 Average agricultural land rental value in the state of Ceara, second semester of 1973.

/2 Indicates negative figures.

/3 Seed cotton with a .35 conversion rate to lint.

traditional techniques as compared to the use of modern technology based on improved seed, chemical fertilizers and more intensive application of cultural practices. This is reinforced by the uncertainty of getting an adequate amount and distribution of rainfall to achieve in practice the expected yields.

Uncertainty, Productivity and Adoption of Technology

106. The benefits an individual expects from applying a particular agricultural technology depends both on the yields (and therefore income) that technology is supposed to generate, as well as on the variability of those yields. The higher the variability of expected yields (for example due to drought), the greater the increase in yields that would be required to persuade the farmer to adopt the technology. Also, the greater the farmer's aversion to the risk of obtaining lower yields than expected (the case of small-subsistence farmers), the higher the amount of income he will be willing to forego by selecting less risky but also less profitable crops to obtain a minimum assured level of income.

107. Data from the SUDENE/IBRD farm survey for the Sertao area, covering the three major population groups in the area -- sharecroppers, small landowners and large farmers -- as well as the three major crops -- cotton, corn and beans confirm that:

(a) If sharecroppers were willing to accept incremental costs associated with increases in productivity, their absolute incomes would increase. But when the risk of incurring higher costs are considered, sharecroppers are likely to avoid the higher outlays and, consequently, reject the new technology unless it also leads to a reduction in the variability of their expected income.

(b) Landowners as a group would also tend to refuse technological progress that implies higher cash outlays under a situation of risk. In fact, the only group which appears to be in a condition to accept reasonably riskier technological packages is the small landowners, since they would not have to share part of the expected benefits and costs as is the case in sharecropping arrangements. However, this group is relatively small compared with Northeast rural population and, barring its expansion through agrarian reform, the effects of a program designed to benefit small landowners exclusively would have limited effects on rural poverty.

(c) Cotton, the basic cash crop, appears to be the product with the greatest potential for diffusion of technology, since it generates the largest increases in risk-free income for all population groups involved, reflecting its greater resistance to drought.

(d) Mounting a program oriented to increase productivity of sharecroppers would require a modification of the traditional sharing arrangements 1/ in favor of the sharecropper to counteract his higher risk aversion. Subsidization of crop insurance would probably have a greater impact in adoption of technology to subsidize a crop insurance scheme than the present government practice of heavy subsidization of interest rates.

108. All this implies that a basic reorientation is required in agricultural research and technical assistance aimed at small farmers. The focus should be on simple, labor-intensive technical packages such as push or animal-drawn cultivators, low-cost soil and water conservation practices, and drought-resistant improved seed, which can increase output and/or reduce risks with only marginal increases in investment and annual operating costs. Only when such technologies have been proven adaptable to specific locations in the Northeast, and farmers are convinced of their profitability, will there be sufficient incentive for farmers to abandon their present technological practices and participate voluntarily in programs to increase productivity.

B. The Extension Service: Present Potential and Future Needs

109. A relatively large number of separate institutions are involved in technical assistance to agriculture. Most of them provide services related to only one agricultural product, and in some instances these services are restricted to a particular geographical area, as is the case of IBC (Brazilian Coffee Institute), IAA (Sugar and Alcohol Institute), CONDEPE (Council for the Development of Beef Cattle) and CEPLAC (Executive Commission for the Plan for Economic Recuperation of Cacao Plantations). The universities, the agricultural research centers, the State Secretariats of Agriculture and private institutions such as cooperatives, farmers associations and large agro-industries are also engaged in providing various forms of technical assistance. The largest input of technical assistance in agriculture, however, comes from the Brazilian System of Rural Extension, composed of a central federal institution, ABCAR (Brazilian Association of

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1/ An additional problem appears to be that even if owners and sharecroppers share costs of new inputs in the same proportion (e.g., 50:50) as output, the real share of the sharecropper is higher than this because he must devote increased family labor to harvest cotton at the peak season during which, prior to the package of the inputs, he could find alternative employment on other farms at a wage higher than in the rest of the year. Once this foregone out-hiring income is counted into the total cost of the package, the effective share of the sharecropper rises to more than 50% even if the nominal share he pays in costs of the new inputs is only 50%.

Credit and Rural Technical Assistance), and 23 non-profit, technically and administratively autonomous entities in the various states, known as ANCARes in the states of the Northeast. 1/

110. The effectiveness of the extension system has been limited by lack of coordination of its work with other extension activities, lack of long-term objectives and planning and protracted financial instability of the executing agencies at the state level.

111. There is very little coordination of the programs of the various institutions providing technical assistance in agriculture. Until very recently, most of these institutions were not even formally related to the Ministry of Agriculture. While some coordination and control mechanisms have been instituted within each entity, the lack of an overall coordinating authority has prevented the generation of economies of scale in the execution of technical assistance programs, increasing the cost of providing technical assistance and leading to a misallocation of the scarce human resources available for this activity.

112. The decentralized character of the state affiliates of the rural extension system, particularly in the case of the ANCARes in the Northeast, has provided these agencies with a certain degree of flexibility, enabling them to respond better to particular local demands. These demands are generally met through contracts for the provision of services to or on behalf of other local agencies or beneficiaries. On the other hand, because of this decentralized nature, the ANCARes, as well as the other technical assistance agencies supported with public monies, have interacted only very loosely with each other within the institutional and planning framework of government policy. With rare exceptions, they lack long-term planning and objectives, and their annual work programs are repeated mechanically year after year. As a result, there is hardly any integration among the various sources of technical assistance, resulting in many cases in substantial duplication of work. The Government recognizing that it did not have an overall mechanism of coordination and control capable of orienting and evaluating the technical assistance effort in relation to the country's development objectives and needs has created EMBRATER which will eventually perform this function.

113. The instability and short-term nature of their sources of financing has been a major obstacle to the formulation and implementation of long-term work programs and objectives by the ANCARes of the Northeast. The ANCARes obtain their financing mainly from the federal government, and service contracts with local institutions, banks, states and municipalities. The federal government has contributed 50 to 60% of the financing of technical assistance services in the past, channeled through the Ministry of Agriculture and various other federal institutions, such as ABCAR, INCRA, SUDENE, SUVALE, (now CODEVASF), Bank of Brazil and Bank of Northeast. State and municipal

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1/ For details on the evolution and operations of the extension service in Brazil, see George F. Patrick: A ABCAR Como Instrumento da Politica de Desenvolvimento Agricola, mimeographed paper prepared for IPEA.

governments establish contracts directly with the ANCARes and contribute to their support according to their financial strength (a recent federal decree stipulates that 5% from the State Participation Fund must be allocated to rural extension services). In addition, the ANCARes obtain resources from the banking system through their assistance in programs of supervised agricultural credit (2 percentage points of the interest charged is set aside for this purpose).

114. The flow of federal funds has been very irregular both from year to year, as well as in disbursements within a particular year. The lack of an effective control and evaluation mechanism at the federal level to assess the results of federal expenditures on extension, has resulted in repeated delays and a general reluctance of federal authorities to make budgetary allocations and authorize disbursements for rural extension activities. The resulting financial instability has in turn led the ANCARes to seek other sources of financing, engaging on an ad hoc basis in service contracts with local entities, dispersing their efforts, reducing their planning horizon, and limiting their effectiveness as an instrument for spreading productivity increasing practices in agriculture. For example, in most states the single most time consuming activity of extension agents is the filling out of credit application forms and the supervision of disbursements of agricultural credit operations.

115. The Government is taking steps to strengthen both the research and the extension services. It hopes that EMBRAPA (Brazilian Agricultural Research Enterprise) created in 1973, will be able to devise new organizational and administrative arrangements to make the research system more responsive to production objectives and capable of generating relevant technological packages. The Government also created the Brazilian Enterprise for Technical Assistance and Rural Extension (EMBRATER) in June 1974, as an autonomous entity of the Ministry of Agriculture, to replace the existing system of rural extension and take over the functions that were exercised up to that time by ABCAR. The main purpose of this new federal enterprise is to formulate, stimulate and coordinate programs for technical assistance, closely harmonized with the research activities of EMBRAPA, to achieve the Government's production objectives in the agriculture sector. EMBRATER will exercise its controlling and coordinating power over the extension services operating in the various states through the centralization of all federal budgetary allocations for technical assistance.

116. Simultaneously, the Government has created a National Commission for Agricultural Research and Technical Assistance (COMPATER) with the role of reviewing and coordinating the programs of both EMBRAPA and EMBRATER. Creation of this additional administrative superstructure undoubtedly reflects the Government's determination to make research and extension more effective

and production oriented. 1/ Special attention should be given to coordination at the local level to assure that technical and financial resources will be channeled into assisting in programs designed to reach small farmers.

117. It will take some time before this new extension enterprise, EMBRATER, gets organized, develops a work program and sets objectives and guidelines for the operation of the various state subsidiaries. A basic requirement for improving the effectiveness of the extension service will be the establishment of criteria for evaluation of the results of technical assistance activities in terms of their real contribution to the development of the agricultural sector as a whole, as well as its effectiveness in reaching rural target groups ranging from modern market-oriented producers to subsistence and tenant farmers. The most difficult task will be the linking and coordinating at the local level, and under common objectives, of technical assistance services with agricultural research, with marketing activities and institutions, with the credit system, and with education and training programs both for technical assistance agents as well as for farmers. For the immediate future this can probably only be achieved in selected areas and in the context of integrated rural development projects.

118. The restructuring and strengthening of the extension service is likely to require considerable human and financial resources for training of staff as well as for physical facilities. The availability of field extension agents in the Northeast is quite limited at present. 2/ For example, in Ceara, where cotton is the principal crop with 1.25 million hectares harvested, the extension service only reached some 66,800 hectares or 5% of the cotton area in 1973. This is the largest cotton area ANCAR-CEARA has

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1/ The Government created simultaneously a Commission for Coordinating National Rural Credit Policies (CONCRED) with the purpose of using credit as the vehicle for transmitting research results and technical assistance to the producer.

2/ In 1973, the Extension Service had a technical staff of 1,264, operating in 880 municipalities in the Northeast. Of this staff, 710 were agronomists or veterinarians, some 350 were agricultural technicians and some 200 were social welfare workers. There are about 2.2 million agricultural establishments in the Northeast, not including tenant farmers (1970 Agricultural Census) giving a ratio of over 1,700 establishments per extension worker.

ever attended in the state, as it has been expanding its staff in recent years. Similarly low percentages apply to the main subsistence crops, beans and maize, with 7.7% and 4% of the crop area attended respectively. For effective extension work, it is commonly believed that one agent should not attend more than 300 families. The current ratio in Ceara, which has an extension agent/farmer ratio similar to other northeastern states, is on the order of 1:1,500. In addition to the need for additional staff, the training of existing staff has lacked the content and breadth to effectively disseminate agricultural technology. Major deficiencies have been insufficient knowledge of recent technological innovations and lack of knowledge of practical aspects of application of technology, such as farm budgeting, and assessment of profitability of technological recommendations under local input/output price relationships.

119. The effectiveness of agricultural extension depends fundamentally on the availability of a technological package appropriate to the risk-averting behavior of small farmers. In the absence of convincing technical recommendations, only limited additional funding for technical assistance activities and supporting credit and marketing programs would be required or justifiable. In order for the state extension services to have available profitable practices for dissemination, it will be necessary to put much more emphasis on production oriented technical-economic farm management research efforts. This will require much closer cooperation between the research and extension entities at the national, regional and state level than has been prevalent in the past. In the near-term, EMBRAPA must bear the greatest responsibility for development of solutions for the particular problems encountered by Northeast farmers. While higher productivity inputs and techniques are being devised and proven profitable, the research and extension services should reorient a part of their efforts toward identification of existing cultivation practices currently being used by the more successful small farmers. Practices which moderately increase yields and net incomes, and at the same time reduce the risk of climatic loss such as mulching to conserve the scarce rainfall received and to reduce erosion in the Agreste and Sertao regions, incorporating organic materials to increase water holding capacity in certain soils, determining the appropriate planting times in order to reduce replanting costs, using herbicides on selected crops such as rice to reduce the labor required for controlling weeds and limited application of insecticides on a timely basis, may already be available.

C. Delivery of Technology to Small Farmers

120. The extension agencies in Brazil were originally conceived as a service oriented primarily to small- and medium-size farmers, providing technical assistance and supervised rural credit. Farmers were attended to individually and, because of the large number of small farmers and the small size of their holdings, the number reached and the impact on production

was negligible. As a result, the extension service gradually shifted into providing technical assistance to larger producers and ceased to give credit directly, supporting instead the credit programs administered by the banking system. At present, the bulk of technical assistance for agricultural production is being directed to larger and more creditworthy farmers. 1/

121. A substantial reorientation of extention activities, as well as a different type of organization at the local level, will be required if agricultural technology is to be delivered effectively to large numbers of small farmers within the context of rural development projects. The organization of these projects should be based on the principle that: a very close interagency coordination at the project level is indispensable, agencies must work with groups rather than with individuals, and mechanisms for implementation of a development project must be easily transferrable to other areas.

i. Interagency Coordination

122. In order to increase agricultural production at the farm level, close coordination is needed in:

(a) development of viable technical packages;

(b) delivery of technical information to small farmers;

(c) provision of needed technical inputs at reasonable costs;

(d) provision of agricultural credit; and

(e) increasing access of farmers to marketing channels.

1/ Another type of activity of the Extension Service, which is still primarily oriented to the poorer segments of the rural population, is the provision of social welfare services, including family education, limited health services, nutrition, household administration and farmer's organization. While these activities have an important impact in low-income groups they have to compete for the same limited human and material resources, to production oriented activities and they have not been given a very high priority in the extension service overall allocation of resources. In the Northeast on the average, one out of every six technicians is assigned to social welfare programs.

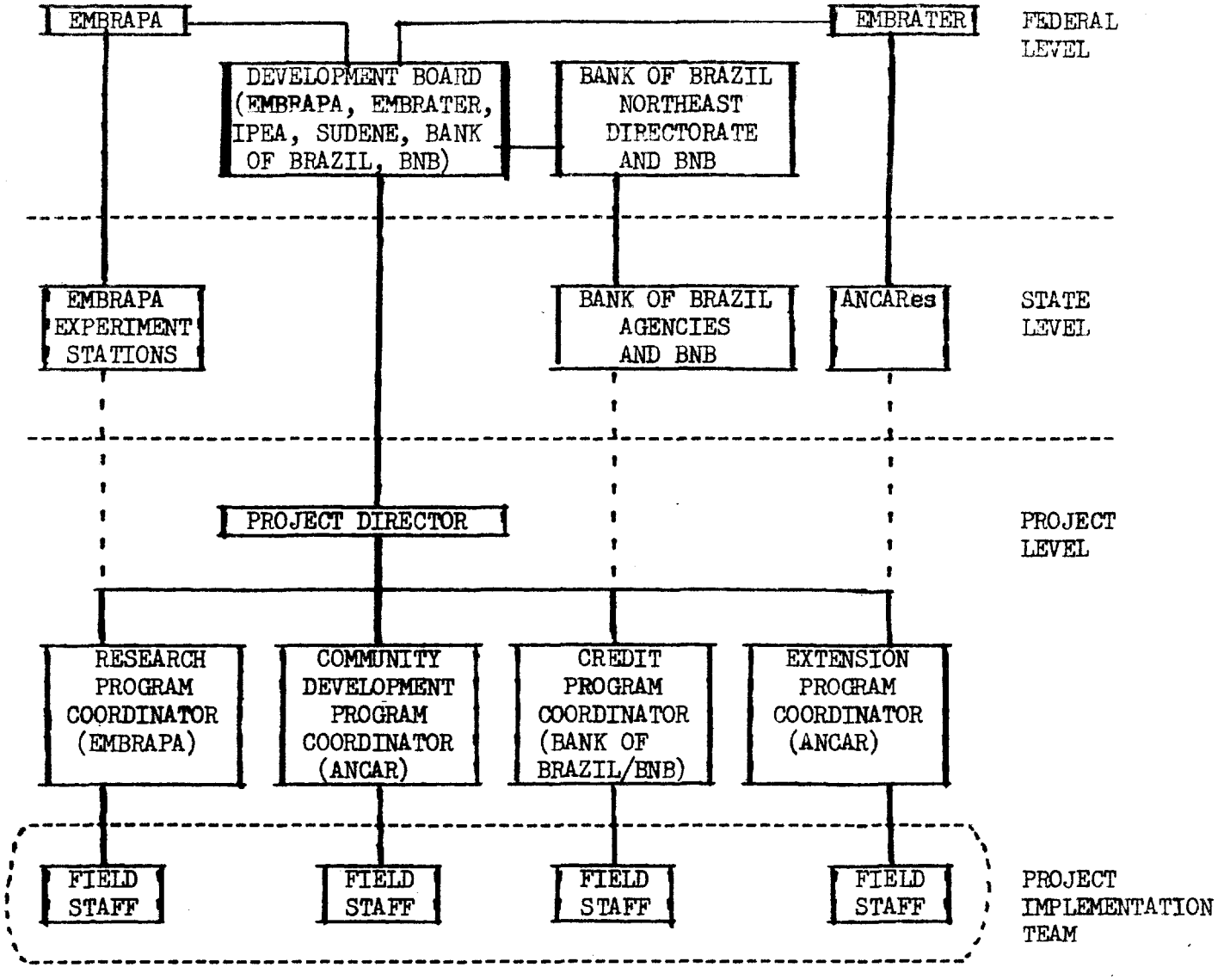
These activities must be coordinated on an almost day-to-day basis at the project level, since it is at this level that programs are ultimately accepted or rejected by farmers. Technical packages must be tested under local conditions, since only when farmers are convinced that a given technology is a profitable alternative for their particular farm will they consider adoption. Similarly, marketing arrangements must be coordinated with other agency programs, since each individual farmer will want to know precisely where and how he is going to obtain inputs and his produce is to be sold, before he assumes responsibility for an agricultural loan.

123. Under present agency arrangements in the Northeast, coordination is achieved at the federal and sometimes at the state level, but in most cases programs are implemented through separate, autonomous, agency channels. The decision-making and coordinating authority is generally concentrated at an administrative level geographically removed from the project site and efforts to coordinate programs at the local level are generally easily disrupted by the need for local staff to respond to dictates from their own supervisors. The informal coordination which presently exists at the local level is clearly inadequate. An arrangement must be instituted at the project level which provides that the project directors have administrative authority over project staff provided by participating agencies. However, situations should be avoided where one of the participating agencies overall administrative authority, with the others in a subordinate role, since this is likely to lead to coordination problems.

124. possible administrative structure for rural development projects is suggested in Figure 1. Under such a plan, the project director would be directly responsible for administration of the project. He would, in turn, be responsible to a national board which would establish policy, allocate funds and coordinate the activities of participating agencies at the national level. The board would be composed of members of those agencies and of the ministries or other entities involved in rural development. The project director would have administrative control over the project staff contributed by the participating agencies. This would assure that the work of the staff at the project level would be coordinated. However, authority over technical matters would still be retained by the participating agencies. For example, the project director may specify how many ANCAR extension agents are to be assigned to the project area and where they are to work. He may also specify that EMBRAPA conduct agricultural research relevant to the project area and that seed demonstration trials be established. Bank of Brazil credit supervisors must also be assigned to the area upon his request. The director could not, however, specify which agricultural commodities are to serve as the focus of research or how the research is to be conducted. Nor could he interfere with ANCAR's extension methodology.

125. What appears to be a double line of responsibility of program coordinators (e.g., to ANCAR or EMBRAPA, and to the project director) would really be the key to successful project administration. Each agency retains

Figure 1: PROJECT LEVEL COORDINATION OF AGENCY PROGRAMS



----- : Technical Authority

_____ : Administrative Authority

Note that technical and administrative authorities are maintained through separate channels.

technical authority over its program coordinator, while the project director has administrative authority over his activity. The ANCAR extension coordinator, for example, would be an employee of the regional ANCAR office, but would be seconded to the project implementation unit. Funds for his support during the duration of the project would be provided to ANCAR by the national development board. During the time he is on loan, he would be directly responsible to the project director. ANCAR would not be able to terminate employment of a program coordinator except on grounds of technical incompetency. However, if his technical performance is unsatisfactory, he could be dismissed from both the project and from ANCAR. This safeguard would have to be built into the project to avoid a situation where qualified program coordinators are removed from the team for purposes of reassignment within ANCAR. Field staff would also be employees of a participating agency (e.g., ANCAR) and would be seconded to the project implementation unit. Unlike project coordinators, however, field staff should not have a dual orientation. They should be under the direct supervision of the program coordinator and should be responsible to him on grounds of both technical and non-technical performance. The coordinator may either transfer them out of the project area or he may terminate their employment with ANCAR.

126. The basic advantage of this type of project organization at the local level is that the project director would have under his control all the staff inputs to implement the project and, in addition, would have the flexibility to redeploy this staff relatively quickly to face contingencies or problems unforeseen during project preparation. Giving responsibility to a single agency which in turn contracts services of other agencies for particular tasks, as is frequently done now for the execution of projects in the Northeast, is likely to be less flexible and thus less effective to deal with complex and interdisciplinary issues likely to emerge in rural development projects.

ii. Organization of Small Farmers

127. Small farmers in the Northeast are numerous and geographically dispersed, and the staff available for technical assistance in the foreseeable future would be far too small to reach a significant number of them on an individual basis. In many areas of the Northeast, for example, there is only one extension agent for each 20,000 rural inhabitants and an important portion of his time is spent in travel between farms. Farmers tend to be regarded as passive recipients of information, generally not being expected or encouraged to participate actively in the dissemination of technology. The action of an individual extension worker could, however, be multiplied through the incorporation of farmers and farmer organizations into the extension process to reach large numbers of small farmers. Without some type of farmer organization, the cost of implementing successful rural development projects would be prohibitive, not only in terms of the requirements of technical assistance, but also in terms of provision of marketing services and infrastructure. Wholesale purchase of consumer goods and

inputs from other sectors or collective marketing of output cannot be carried out in the absence of local leadership and some degree of organization, and if small farmers cannot "reach out" to the markets for their crops, then either they will remain at subsistence levels or else marketing structures will have to be extended down to the farm level, which could involve large public sector expenditures.

128. Small-farmer organizations in the Northeast are either weak or nonexistent. There is a tradition of farmer individualism and limited community involvement, and there is only very limited official support or encouragement of this type of activity. Organization of farmers is greatly complicated by the diversity of land tenure arrangements. For example, in sharecropping areas, the provision of cash advances, inputs and marketing services allows the large landowners considerable control over sharecroppers, to some extent isolating them from the market economy. Rural development projects in these areas would provide alternative sources of inputs and services, as well as channels for their delivery to small farmers, weakening their dependency ties with the landlord. Thus, attempts to encourage cooperatives of minifundistas and sharecroppers within rural development projects might antagonize larger farmers. The organization of informal associations of small landowners and sharecroppers and the provision of some services to these groups could be an initial step. Such informal associations could eventually grow into cooperatives, as small farmers acquire more experience and self-confidence in going from subsistence into commercial production.

129. In their initial stages, rural development projects will have to work with the landowners to increase production of the cash crop (i.e., cotton) and to introduce regulations that assure that some of the benefits derived from improvements in the cash crop are extended to their sharecroppers. At the same time, it will be necessary to work directly with small farmers and sharecroppers to increase their production of subsistence crops and of other cash crops that could be grown independently by small farmers. This parallel approach is suggested for several reasons:

(a) Land owners can be used to pass technical assistance related to cotton production on to their sharecroppers, since they (the landowners) have a vested interest in increasing output. It is not necessary for the extension agent to go directly to the sharecropper in such cases;

(b) Landowners have little interest in working with their sharecroppers on increasing production of subsistence crops and/or cash crops which are not part of the sharecropping enterprise. In this case information must be supplied directly to the small farmers and sharecroppers;

(c) A number of basic services have to be provided directly to small farmers and sharecroppers -- inter alia, improved health facilities, nutrition, education, home economics and market information -- in order to improve their "risk capacity" and to reduce their economic and social dependence on the landowner; and,

(d) The communication techniques and skills needed to relay technical information to minifundistas and sharecroppers, differ from those needed to work with large landowners.

130. The organization of small farmers should probably begin with the small landowners (minifundia owners) and once these are set up, sharecroppers could be gradually incorporated into these associations. This approach would have some advantages, since minifundia owners, while not free from dependency ties, enjoy greater freedom to make investment decisions than do sharecroppers. In addition, while some sharecroppers are secure in their land use arrangements, the situation of others is precarious and they might be evicted if they cooperated with outsiders. The extension agent might be unaware of these variations in tenancy arrangements and might abort a project by attempting to organize sharecroppers whose landlord was in opposition to such programs. Small landowners, on the other hand, would probably know which sharecroppers in their community were most secure in their tenure position and could work with these individuals in increasing production of traditional crops or even cash crops which could be sold through a small-farmer association. This might provide an alternative source of income to sharecroppers.

iii. Replication of Project Design

131. The mechanism for implementation of rural development projects must be quickly and easily transferrable to other areas. To facilitate replication, projects should be simple in design. Thus, they should probably focus on a relatively homogenous area and population target group, and concentrate efforts on increasing productivity of only a few crops. The project should aim at introducing technological changes gradually over several growing seasons to allow for training of staff and for demonstration and spreading of project results to small farmers. It is also important that the project unit be administratively manageable in size. In contrast to a rural development program which could be made up of several projects, encompass sizeable

areas of the northeast, and include a large number of small farmers, 1/ the unit of execution under one project director should probably not cover an area with more than, say, 15,000 families. In the administrative setup illustrated in Figure 1, each program coordinator (four of them under each project director) would employ a staff of 15 to 20 field workers who would operate together at the farmer level as an interdisciplinary team composed of an ANCAR community development worker, an ANCAR technical instructor, a Bank of Brazil and/or BNB credit supervisor and an EMBRAPA research worker. All project directors would be under a national rural development board or committee. Since the first projects must serve as a demonstration and training ground for successive projects, they cannot afford to be a failure. The first projects should be, therefore, initiated in areas with better than average soil and weather conditions and should be based on a relatively well-known technological package sufficiently profitable under prevailing marketing conditions to make it attractive to small farmers.

1/ There are at present probably some two million rural families in the Northeast, which could be targets for rural development projects. The 1970 Population Census estimated the number of rural families in the Northeast at 3.09 million (16.3 million individuals). According to Langoni's data, the average upper limit of individual income of the bottom 40% of income earners was US$124 per month in 1970, and 68.6% of the individuals working in the primary sector earned less than that income. Thus, the number of Northeast rural families in the lower 40% of Brazilian income distribution would be 2.12 million. See Langoni, op. cit., pp. 26-30.

V. SMALL-FARMER CREDIT

132. Very little of the increase in the availability of rural credit in the Northeast has apparently gone to small farmers. The limited access to credit of small-farm operators without land litle or owning plots of less than ten hectares, who make up almost two-thirds of the agricultural labor force and are generally regarded as not creditworthy by institutional credit agents, constitutes a significant impediment to their rise out of poverty. Nevertheless, credit is an essential factor in the functioning of an agrarian economy and despite the absence of institutional credit, small farmers often do receive financing. But the mechanism by which this credit is delivered tends to perpetuate the conditions of dependence and poverty of small farmers. An essential part of the economic relationship between peasant and landlord, or between minifundista and intermediary providing inputs or marketing services, is the provision of noninstitutional credit. Because of the frequent crop failures and the monopolistic position of the provider of credit, the small farmer usually is in a state of permanent indebtedness and dependence, and is unable to take advantage of price incentives or market opportunities. While lack of institutional credit is certainly not the root of the rural poverty problem in the Northeast, improving the access of small producers to such credit would help them break out of the monopolized world that keeps them from the more favorable input and output prices available in the free market. Thus, a credit program focussing on the small farmer can lead to a basic change in economic horizons and an improvement of the conditions under which peasants buy, sell and consume. When the institutional credit system reaches out to the peasant farmer it is competing with its own customers, the better-off landowners and other noninstitutional credit intermediaries. To be effective, the institution must of necessity intrude into the relationship between landlord and peasant, while avoiding incurring the enmity of the displaced party. This is difficult because availability of institutional credit reduces dependence of the peasant on the landlord, restricting the economic power of the latter. This explains why credit can be a somewhat more powerful instrument in dealing with rural poverty than might appear at first sight. It also may, in part, explain why there is strong resistance to introduction of small-farmer credit programs.

A. PROTERRA Agricultural Credit

Background

133. The most significant recent approach to Northeast agricultural development through the credit system is the PROTERRA program, created in July 1971. About 40% of PROTERRA allocations have been used in credit programs and a slightly smaller share in construction of the Trans-Amazon Highway (Table 26). The rest has been divided between the development agency for the San

Table 26: USE AND ORIGIN OF PROTERRA FUNDS, 1972-74

(Current Cr$ million)

	1972			1973			1974
	Allocated	Disbursed	Carry-over	Allocated	Disbursed	Carry-over	Allocated
I. Credit:							
A. Refinancing/Repasse to Financial Agents/1							
Agro-industry	93.0	60.3	32.7	30.0	47.7	15.0	130.0
Crops-livestock	131.0	127.5	3.5	78.0	81.5	-	170.0
Land/2	84.0	84.0	-	60.0	60.0	-	47.0
Subtotal	308.0	271.8		168.0	189.2		347.0
B. Subsidies in Credit/3							
Technical Assistance	20.0	6.0	14.0	28.5	28.5	14.0	56.0
Interest-modern inputs	40.0	21.0	19.0	8.7	18.7	9.0	44.0
Interest-investment	50.0	32.7	17.3	80.0	85.3	12.0	166.0
Subtotal	110.0	59.7		117.2	132.5		266.0
Total Credit	418.0	331.5	86.5	285.2	321.7	50.0	613.0
(Resources of Financial Agents)		n.a.			(1,750.0)		(1,500.0)/4
II. Infrastructure (Transport, Mines and Energy)/5	250.0	240.0	10.0	355.0	365.0		262.0
III. Ministry of Agriculture:							
INCRA	87.0			120.0	n.a.		47.0
Other/6	80.0			90.0	n.a.		100.0
Total	167.0		167.0	210.0	196.0/9	181.0	147.0
IV. PROVALE	90.0	82.2	7.8	105.9	113.7	-	144.0
V. Others/7	20.0	6.1	13.9	32.8	34.7	12.0	54.0
TOTAL	945.0	659.8		988.9	951.1		1,220.0
Origin of Funds:							
Central Bank				230.0			300.0
Fiscal Incentives/8				758.9			920.0
				988.9			1,220.0

/1 Financial agents are the Bank of Brazil (BB), the Bank of the Northeast (BNB), the National Cooperative Credit Bank (BNCC), the Amazon Bank (BASA), and the National Development Bank (BNDE). The BB and BNB receive refinancing only, and no repasses.

/2 Repasse only. This amount is part of the allocation to the Ministry of Agriculture (Item III). The land credit funds, like the rest of the MAG allocation, come from tax deposits rather than Central Bank reserves, and are channeled to the Central Bank through the Ministry. In 1972, land credit allocations were originally Cr$54 million more than indicated in the table. The BNB subsequently asked Cr$24 million of its Cr$30 million for credit be transferred to the crop-livestock category, leaving Cr$6 million; BASA asked that all of its Cr$15 million for land credit be transferred to crop-livestock credit.

/3 2% of the value of any individual financing may be spent for technical assistance for preparation of the project.

/4 Ceiling set by the Central Bank. Composed of Cr$1,200 million for BB, Cr$150 million for BNB, Cr$100 million for BNDE and Cr$50 million for BASA.

/5 Most of these funds were spent in construction of the Trans-Amazon Highway.

/6 (1) Other promotion programs of MAG (Cr$37.6 million for 1974) including BNB courses in regional planning, atmospheric research, etc.;
(2) INFAOL - seeds and demonstrations (Cr$11.0 in 1974);
(3) Amazon Recuperation (Cr$5.4 million in 1974).

/7 Miscellaneous activities including land titling under supervision of INCRA (Cr$20 million in 1974), technical assistance, cooperatives, rural extension, feeder roads, research, rural electrification, minimum price program, reservoir-building.

/8 20% of 34/18 tax deposits and of "sectoral incentives" deposits.

/9 This entry is 116 in the Central Bank data. The rest of the data on this line make it appear that this was an incorrect transcription of 196.

Source: Based on data from the Central Bank, GECRI.

Francisco Valley (PROVALE) and the Ministry of Agriculture. The land expropriation and colonization programs of INCRA have received about one-third of the funds going to the Ministry of Agriculture. Though much of the official pronouncements concerning PROTERRA have emphasized the land distribution aspects, only 12% of the program's funds were allocated for this purpose in 1973 and 4% in 1974.

134. PROTERRA credit operations have aimed at modernizing Northeast agriculture 1/ by heavily subsidizing the cost of credit for investment, modern inputs and land purchase. PROTERRA credit accounted for more than half of the Northeast rural credit of the Bank of Brazil in 1973 (Table 27). Though the PROTERRA credit program has five financial agents, 2/ the Bank of Brazil dominates PROTERRA lending, accounting for about 80% of PROTERRA loan value in 1972 and 1973, the same as its share of institutional credit in the North-east (Table 28).

135. The principal source of funds for PROTERRA is an allocation of 20% of the 34/18 deposits. An almost equal contribution is made by the Central Bank, out of its receipts from the financial operations tax. These funds are used for onlending to or refinancing of the financial agents. 3/ The major share of PROTERRA credit, however, comes from the financial agents -- mainly, the Bank of Brazil. In 1973, Cr$1,750 million were put into the program by its financial agents -- more than five times the government contribution (Table 26).

PROTERRA Interest Rates

136. Interest rates on PROTERRA credits are substantially below those available on normal credit operations. The borrower pays 7% interest without monetary correction for investment loans, which represent the major share of the PROTERRA credit, instead of the 15% generally charged on rural credit operations outside of the program (Table 29). The borrower pays no interest on loans for most modern inputs financed under the program and 7% without monetary correction for the rest. The land-sale credit carries 12% interest

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1/ Most of the Northeast credit data in this chapter refer to seven rather than to nine states -- Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe and Bahia, excluding Maranhao and Piaui. The seven states correspond to the 2nd Region of the Bank of Brazil, its administrative definition for the Northeast. The 2nd Region accounts for 80% of Bank of Brazil rural credit in the Northeast, and for about 65% of PROTERRA lending, part of which occurs outside the nine-state Northeast. Tables specify whether data are 2nd Region on all nine states.

2/ Bank of Brazil, Bank of Northeast, National Bank for Cooperative Credit, National Bank for Economic Development and Bank of the Amazon.

3/ Funds for onlending land-sale credit do not come out of the Central Bank credit line. They are part of the PROTERRA allocation of tax revenues to the Ministry of Agriculture, and are channeled through the Ministry to the Central Bank. (See Land Credit section in Chapter III.)

Table 27: BANK OF BRAZIL - 2ND REGION/1 PROTERRA CREDIT AND TOTAL RURAL CREDIT (LOANS GRANTED), 1971 - 1973

(Current Cruzeiros)

	Value (Cr$ million)		% PROTERRA of total	No. of contracts (thousand)		Av. value of contract (Cr$ thousand)	
	Total	PROTERRA		Total	PROTERRA	Total	PROTERRA
1971/2	934.1	348.4	37.3	140.0	28.4	6.7	12.3
1972	1,324.0	677.5	51.1	136.3	45.9	9.7	14.8
1973	1,902.2	1,064.5	56.0	136.8	42.3	13.9	25.2

/1 The 2nd Region is an administrative category of the Bank of Brazil. It includes seven states of the Northeast -- Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe and Bahia. The traditional definition of the Northeast includes Maranhao and Piaui as well. The 2nd Region accounts for 80% of Bank of Brazil rural credit, and for about 65% of PROTERRA lending.

/2 PROTERRA credit started officially in 1972. It incorporated a previous similar program, created by Resolutions 175 and 181 of the Central Bank.

Source: Based on data from the Bank of Brazil, COGER, DEPDA-CEDIR.

Table 28: PROTERRA CREDIT - BANK OF BRAZIL AND BANK OF THE NORTHEAST (LOANS GRANTED)/1 1972-74

(Current Cr$ million)

	Bank of Brazil				Bank of Northeast				
	Value	No. of contracts (1,000's)	Av. contract	% of total	Value	No. of contracts (1,000's)	Av. contract	% of total	Total value/2
1972	980.9	60.5	16.2	79.5	197.4	6.0	32.9	16.0	1,234.4
1973	1,758.1	53.9	32.6	79.8	333.1	6.8	49.0	15.1	2,202.7
1974/3	418.4	8.3	50.2	75.9	62.1	0.8	74.9	11.3	550.6

/1 Includes North and Maranhao-Piaui, in contrast to Tables 27 and 30, which include only the seven states of the 2nd Region.

/2 Includes BNCC, BASA, and BNDE, which account for about 5% of the total.

/3 As of March 31, 1974.

Source: Based on data from Central Bank, GECRI.

Table 29: PROTERRA CREDIT - TERMS AND CONDITIONS

Program	Interest rate	CB subsidy/1	Grace period (years)/2	Amort. period (years)/2	Purpose
CEN (Res. 147, June 1970)	5	-	3	8	refinancing; labor-intensive investment
CRAN (Res. 75, March 1971)	7	5	3	8	investment for drought recuperation
PECRO (Res. 181, March 1971)	7	5	3	8	investment in North and Northeast
PROTERRA (Res. 224, June 1972) (with own resources)					
Investment					
semi-fixed capital	7	5	2	5	investment covered by normal rural credit, excluding acquisition of vehicles, cattle for fattening, and certain imported items
fixed capital	7	5	12	12	
heavy tractors, etc	7	5	3	8	
Modern inputs					
without interest	0	12	-	1-2/3	fertilizers, correctives, innoculants; organic fertilizer; protein supplements; mineral supplements; vitamins and antibiotics; pesticides; veterinary medicines; improved seeds and grafts; frozen semen; fuels, lubricants and electric power expenses; balanced feed; syrup for cattle fattening
with interest	7	5	-	1-2/3	mechanized agricultural services; honoraria of agronomists, veterinarians, agricultural technicians and other technical assistance; domestic tractors and agricultural equipment, pure-bred bulls for breeding
PROTERRA (with Central Bank refinancing)					
Investment	7	- 2	same	same	same
Land	12	0	2	12	area acquired cannot exceed 6 modules
Modern inputs					
without interest	0	5	-	same	same
with interest	7	- 2	-	same	same
Agro-industry	17	-13	3	12	fixed investment in agro-industry or industries making agricultural inputs

/1 Subsidy paid by Central Bank to financial agent; negative numbers are amounts paid by financial agent to CB.

/2 Grace and amortization periods are maximums.

/3 Except for the following: correctives and mechanized services for conservation of soil - up to eight years with three years grace; bulls - up to five years with two years grace; light agricultural machinery - up to five years with two years grace; heavy machinery - up to eight years with three years grace.

Table 30: BANK OF BRAZIL - 2nd REGION PROTERRA CREDIT (LOANS GRANTED), 1972/73

(Current Cr$ million)

	Value		% of Total	
	1972/1	1973	1972	1973
Investment	443.8	721.7	65.5	67.8
Land/2	59.2	26.3	8.7	2.5
Modern inputs	170.9	244.8	25.2	22.9
Agro-industry/3	3.6	71.7	0.5	6.7
Total	677.5	1,064.5	100.0	100.0

/1 See footnote 1 of Table 36.

/2 Land accounted for 6.7% of PECRO and CRAN credits in 1971 - Cr$23.4 million out of Cr$348.4 million. Other data for 1971 are not available according to the breakdown of this table.

/3 Includes industries producing agricultural inputs.

Source: Based on data from the Bank of Brazil, COGER.

and a 12-year repayment period, and the credit for agro-industry and manufacturers of agricultural inputs costs 17%. The borrower's interest payments to intermediaries are supplemented by the Central Bank to yield a return of 12% to the financial agent when he uses his own resources, and 5% when he avails himself of Central Bank refinancing. This compares to a return of 15% available on operations over 50 times the minimum wage outside of the PROTERRA program. 1/

137. In spite of the lower interest rate to lenders on PROTERRA credit (12% compared with 15% for normal rural credit), substantial amounts of resources have been made available for the program, particularly by the Bank of Brazil. This is because the Bank of Brazil, as a quasi-public agency, has available for lending a generous supply of government deposits on which it pays no interest. In addition, credit granted by the Bank of Brazil under the PROTERRA program falls outside the credit ceilings imposed on it by the Central Bank. Thus, by lending its resources for PROTERRA operations, which are subject to a separate ceiling, the Bank of Brazil can considerably increase the total amount of credit it can extend in any particular year. 2/

Origin of PROTERRA Credit

138. In June 1970, at the height of a severe drought in the region, the Central Bank approved an Emergency Credit program for the Northeast (CEN)

1/ For loans up to 50 times the minimum wage, the Bank of Brazil charges 10%. It would seem to the Bank of Brazil's advantage to concentrate on PROTERRA lending in the small-loan category to gain the extra two percentage points of interest. As pointed out below, however, the average size of the PROTERRA loan is much larger than normal, indicating a bias away from the small loan. Either the interest rate advantage of the small PROTERRA loan is offset by higher per unit costs of such lending, or considerations other than cost differences of this magnitude are more determinant in allocating such highly subsidized funds.

2/ In contrast to the Bank of Brazil, it would seem that the Bank of the Northeast (BNB) would be discouraged from PROTERRA lending with its own resources by the interest-rate differential between PROTERRA and normal rural credit. The BNB has been experiencing a shortage of government deposits (primarily 34/18 funds) and should want to allocate its scarce deposits to their highest yielding uses -- namely the 15% returns of normal rural credit. The high percentage of PROTERRA lending financed out of the BNB's own resources, then, is less understandable than in the case of the Bank of Brazil, whose deposits were greater than the lending it was allowed. It seems, however, that the Central Bank used its refinancing facilities for nonrural lending as leverage for encouraging PROTERRA lending by the BNB out of its own r-sources. The Central Bank, that is, would often grant refinancing to the BNB for individual nonrural loans only after the BNB would commit a matching amount of its own resources to PROTERRA lending.

authorizing a special credit allocation by the Bank of Brazil to refinance its outstanding agricultural loans and to open a line of emergency investment credit. The CEN credit was highly subsidized -- 5% for eight years, with three years grace. (Previous interest rates for this credit had been 17%.) Previously, considerable public funds had always been spent on public employment projects, such as road maintenance and reservoir construction during the Northeast droughts. It was felt, however, that these employment effects could be achieved more efficiently and humanely by financing investment projects on the farms which were generating the unemployed labor. Large property owners would be encouraged with subsidized credit to undertake labor-intensive construction projects such as reservoir construction on their properties. The credit would be contingent on a contractual commitment by the borrower to maintain in his employ, for the duration of the drought, his workers, sharecroppers, and tenants, thus providing work without requiring the movement of the worker and his family. 1/

139. The CEN investment credit represented a unique attempt to specify employment-creating criteria for subsidized investment projects 2/ and to shift a part of the cost of maintaining unemployed labor during the drought to the farms. The CEN program showed that the Bank of Brazil could act quite rapidly. Credit applications were approved in less than a week, as approval procedures were cut down to the bare minimum. Despite this, the Bank has not yet had more than ordinary losses on these credits, and some loans have been amortized in advance.

140. The CEN program of 1970 was followed in March 1971 by another Central Bank resolution creating a Special Credit for the Recuperation of Northeast Agriculture (CRAN). This was a one-year program authorizing the Bank of Brazil, the Bank of Northeast and the National Bank for Cooperative

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1/ A similar emergency drought credit program had been conceived during the 1958 drought, but it didn't start functioning until 1960, and therefore had little impact. The CEN program was small in comparison to federal expenditures on the work fronts in 1970 (Cr$20 million compared to Cr$332 million). The employment effect claimed for the CEN program was, however, somewhat more significant -- 56,000 jobs in comparison to the 450,000 jobs of the work fronts. See SIRAC, Carater e Efeitos da Seca Nordestina de 1970, SUDENE, Recife 1973; and Mailson Ferreira da Nobrega, "Desenvolvimento da Agropecuaria Nordestina: O Banco do Brasil e a Acao Governmental," Boletim do Banco do Brasil, Ano VII, No. 3, 1973.

2/ The principal objective of Central Bank Resolution creating CEN was "the avoiding of the migration of workers and small farmers." Funds were disbursed only with proof of payment by the borrower of "the wages due the rural workers and with an explicit commitment (by the borrower) to maintain and pay the workers."

Credit to grant "special loans to small- and medium-rural producers." As in the case of the predecessor CEN, sugarcane and cocoa were excluded, as being outside the area affected by the drought. Smallness was defined as annual production value up to 100 times the minimum wage, and medium up to 1,000 times. The size limits could be exceeded in the case of loans for restoration of perennial crops and investments in livestock. This exception resulted in these activities dominating the program. CRAN specified an interest rate of 7% for the final borrower, with repayment periods of eight years, as in CEN. The Central Bank would pay the financial agent a subsidy of 5%, bringing the return to the agent to 12%.

141. CRAN was superseded and absorbed by a Special Program of Guided Rural Credit (PECRO) created one month later. PECRO represented a shift of emphasis to a longer term special credit program (1971-1974) for the North as well as the Northeast. Its stated goal was "promoting a greater balance between the socioeconomic development of the different areas of the country by stimulating an increase in productivity of the rural sector, in the supply of food products and industrial raw materials, and in employment." In addition to the interest rate subsidy, a 2 percentage point Central Bank subsidy was added to cover the cost of technical assistance in loan project preparation. This feature was carried over into the PROTERRA program. The PECRO and CRAN credit programs contributed to a real increase of more than 60%, in Bank of Brazil rural credit in the Northeast in 1971, and accounted for 37% of its rural lending in the region that year (Table 27). In fact, the impact of these operations on the volume of Bank of Brazil Northeast credit was much more striking than that of the PROTERRA credit program, which superseded them in 1972. Under PROTERRA, the Northeast barely maintained its share of total rural credit attained in 1971.

142. The PECRO and CRAN credits were concentrated to a considerable extent in livestock-farming investment (26% in pasture formation, 12% for reservoirs and 7% for land clearing). 1/ The share of credits granted for this activity may have been disproportionately large compared with the damage to livestock caused by the drought, as cattle herds and milk production in the Northeast actually increased during the drought year. Cotton production, in contrast, fell by 40.1% in 1970, in comparison to a 1.5% decline in the previous year. 2/ A survey carried out during the drought found that while real income for crops fell to 37% of the previous year,

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1/ Most of the reservoir and land-clearing investments were related to livestock farming. Almost no credit under PECRO and CRAN went toward the replenishment of livestock herds -- perhaps in accordance with the employment-encouraging aspect of the program, which after CEN was only hortatory.

2/ Based on data from IBGE, Anuario Estatistico do Brasil 1971, pp. 148, 161-162 and 165. Floods in 1969 caused the decline in cotton production.

the income for livestock fell much less, to 87% of the previous year's. 1/ The lesser damage to cattle production during the drought reflects the high priority given by farmers to preservation of their herds during droughts -- to the point of allowing them to forage in the cotton plantings, wreaking considerable damage. Moreover, the emphasis of past drought programs on construction of a dispersed network of reservoirs also favored the preservation of cattle during the drought, since they could be moved to the vicinity of the reservoirs. The drought recuperation credits, then, showed a bias toward livestock lending that would continue with the PROTERRA credits.

143. In June 1972, the PECRO and CRAN credits were subsumed under the PROTERRA program. In addition, PROTERRA incorporated FATOR, a credit program initiated by the Central Bank in November 1971, which subsidized working capital credit for "modern inputs." The resolution creating PROTERRA also opened a new Cr$100 million line of credit to agro-industry and industries producing agricultural inputs.

Orientation of PROTERRA Credit

144. The PROTERRA credit program maintained the interest rate subsidies and loan terms of CRAN, PECRO and FATOR, and dropped the small- and medium-size farm limitation. It dropped the employment objective as well and discontinued the exclusion of sugar and cocoa, except for certain types of sugar investments financed by the Institute of Alcohol and Sugar (merger, incorporation, relocation). Geographic coverage was broadened to include the humid zones of the Northeast, as well as the states of the North -- a shift that started with PECRO. The specific emphases of employment, drought-prone areas, farm size, and cattle and cotton were replaced by a general concern for modernization.

145. Despite the geographical broadening and shift in emphasis, PROTERRA in many ways resembled the Bank of Brazil's special drought credits. Investment continued to dominate the loans (about 65%) even though financing for many working capital expenditures classified as modern inputs could be had at no interest. The bias toward livestock, especially cattle, continued. Livestock accounted for about half of PROTERRA lending in 1972 and 1973. Pasture-forming, land-clearing and reservoir construction activities continued to be important, but their share was more than halved. In their place, credits for the acquisition of animals, of insignificant proportions in the drought credits of 1971, assumed major importance. Purchase of cattle accounted for the largest share of the PROTERRA livestock investments (28%) in 1972, and rose to more than one-half the total in 1973. The number of cattle financed in 1973 represented 2.4% of the Northeast's cattle herd in that year -- a significant share, considering that the rate of net increase of the Northeast

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1/ The population surveyed was biased toward lower income farmers and laborers. The data is therefore only partial evidence of the relative degree of damage to livestock of the drought. Carater e Efeitos da Seca, p. 129.

Table 31: BANK OF BRAZIL - 2nd REGION, PECRO AND CRAN - PROGRAM OF SPECIAL CREDIT FOR NORTHEAST AGRICULTURE, 1971/1

(Cr$ million)

	Value	% of Total
Formation of perennial cotton	33.7	10.4
Other perennial crop formation	23.3	7.2
Acquisition of livestock	2.5	0.8
Improvements	155.8	48.0
Storage structures	(3.5)	(1.1)
Clearing of land	(22.5)	(6.9)
Processing installations	(3.6)	(1.1)
Reservoirs, canals, irrigation	(38.3)	(11.8)
Pasture formation	(82.8)	(25.5)
Rural residences	(5.1)	(1.6)
Machinery	7.3	2.3
Agricultural machinery	(3.5)	(1.1)
Traction animals	(3.8)	(1.2)
Other improvements and machinery	100.1	30.8
Other/2	2.6	0.8
Total	325.3	100.0

/1 From March to December. CRAN (Credit for the Recuperation of Northeast Agriculture) and PECRO (Special Program of Guided Credit) were created by the Central Bank Resolutions 175 and 181 of March 1971. PECRO covered the North as well as the nine states of the Northeast; the 2nd Region, however, accounted for 80% of these expenditures. Data does not include land purchase credit under PECRO.

/2 Rural electrification, reforestation, hatcheries, protection and restoration of soils and vehicles.

Source: Based on data from Bank of Brazil, Directorate - 2nd Region.

herd is somewhere around 2 or 3%. 1/ In addition, PROTERRA livestock loans are considerably larger than regular Bank of Brazil livestock loans. Thus, although PROTERRA credit policy gave no special place to cattle -- in contrast to the preceding PECRO and CRAN programs -- it turned out to subsidize the growth of that activity considerably.

146. The PROTERRA subsidies were originally planned to cover the period 1972 to 1976. The publicly announced termination date, no doubt, influenced the kind of investment undertaken with PROTERRA funds. The five-year availability of highly subsidized funds would tend to attract those looking for speculative investments, who would want to make use of those cheap funds while they are available, more than farmers who have long-term investment and modernization plans. As an example of the short run incentive effects of PROTERRA credit, BNB officials in Recife reported a considerable increase of land buying in the nearby Agreste by city-based persons. Though the land purchase was in most cases not financed by PROTERRA land credit funds (which require residence on the property), the availability of highly subsidized funds for clearing, planting, and acquiring livestock represented a substantial inducement to the purchase of land. It was believed by some Bank of Brazil and BNB managers that this inducement was contributing to the conversion of considerable agricultural land to pasture.

147. PROTERRA credit, in summary, helped make land along with livestock a more attractive form of asset-holding. To this extent, it led more to a redistribution of existing credit toward asset-concentrating activities than toward a modernization of Northeast agriculture. This increased attractiveness of livestock holding, in turn, was occurring at a time of considerable subsidization of livestock farming elsewhere in Brazil. No policy decision was behind the PROTERRA livestock development, however, nor any clear assumptions, about the relative advantage of the Northeast in livestock farming.

PROTERRA Credit Subsidies

148. The PROTERRA credit program specifies certain working capital inputs which bear no interest (Table 29), in an attempt to stimulate the use of modern techniques in Northeast agriculture. Of these modern input credits in 1972, more than half went for fertilizer purchase (Table 33). The sugar

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1/ Data on herd sizes and growth rates in the Northeast are incomplete and unreliable. Ideally, one would want to compare the 1973 PROTERRA-financed acquisitions with the 1972 herd size, but 1972 data are not available. The Northeast cattle herd was estimated at 16,456,769 head in 1973, in "Pecuaria de Corte," Conjuntura Economica, June 1974, p. 108. In order to make this figure consistent with the PROTERRA acquisitions figures, which are for the seven-state Second Region, it was reduced by 20% to 13,165,415, which is the relation between the Bank of Brazil 2nd Region and the Northeast herd size.

Table 32: BANK OF BRAZIL - 2nd REGION, PROTERRA LIVESTOCK CREDIT (LOANS GRANTED), 1972/73

(Current Cr$ million)

	1972		1973	
	Value	%	Value	%
Working capital	29.3	9.5	59.5	10.8
Poultry	(5.8)		(8.2)	
Cattle	(22.3)		(49.0)	
Others	(1.3)		(2.3)	
Acquisition of animals	87.9	28.3	290.4	52.8
Cattle	(87.1)		(285.2)	
Others	(0.8)		(5.2)	
Improvements	180.0	58.1	173.6	31.5
Clearing of land	(5.6)		(5.3)	(1.0)
Reservoirs, wells, irrigation	(17.0)		(18.0)	(3.2)
Pasture	(67.3)		(52.5)	(9.6)
Others	(90.1)		(98.0)	(17.8)
Agricultural machinery	7.4	2.4	16.8	3.1
Vehicles	3.2	1.0	7.3	1.3
Others	1.5	0.1	2.2	0.4
Total	309.3	100.0	549.7	
Total Bank of Brazil livestock loans (2nd. Region)	408.9		645.0	
PROTERRA Livestock/Total Livestock (%)	75.8		85.2	
Total PROTERRA Credit (2nd Region)	677.5		1.1	
PROTERRA Livestock/Total PROTERRA (%)	45.7		51.6	

Source: Based on data from Bank of Brazil - 2nd Region.

Table 33: BANK OF BRAZIL - 2nd REGION PROTERRA CREDIT BY USE, 1972

Use	Value/1 (Cr$ million)	% of total
Investment	419.7	60.2
Land	59.5	8.5
Modern inputs (zero interest)	191.8	27.5
Fertilizer	(109.3)	(15.7)
Livestock inputs/2	(15.6)	(2.2)
Other crop inputs/3	(9.1)	(1.3)
Nonspecified inputs	(57.8)	(8.3)
Modern inputs (7% interest)	25.7	3.7
Equipment and tools	(25.7	(3.7)
Others/4	-	-
Total	696.8	100.0

/1 The values for investment and modern inputs are lower than those of Table 30. Reconciliation was not possible because the values of this table were obtained by aggregation of data available for 1972 only. The values of Table 30 were already available in aggregate form and allowed for the inclusion of 1973.

/2 In order of importance: Protein supplements, balanced fee, veterinary medicines, frozen semen. Protein supplements account for the major part.

/3 In order of importance: Pesticides, seeds, soil correctiveness, grafts. Pesticides account for the major part.

/4 Technical assistance from agronomists, fuels and lubricants, electric power.

Source: Based on data from Bank of Brazil, Directorate - 2nd Region.

industry of the humid coastal zone, however, accounted for three-fourths of these purchases. Cocoa, also of the coastal zone, accounted for the largest share of the remaining part (14%). Sugar and cocoa were already the recipients of considerable subsidy through the programs of the IAA and CEPLAC. Before PROTERRA, moreover, sugar producers accounted for almost 90% of fertilizer purchases in the Northeast. 1/ This means that PROTERRA modern input credit probably substituted, to a considerable extent, for normal rural credit. Thus, the modern input credit represents a direct subsidy to the sugar growers of 15% of the cost of their normal fertilizer purchases. As in the case of livestock, then, the PROTERRA modern inputs credit favored a crop which was not the object of formal policy attention of this particular program, and which was already the recipient of considerable subsidy through another program, while not necessarily fulfilling the modernization goals underlying the subsidies of the PROTERRA program.

PROTERRA Credit and Small-Farmer Development

149. The larger loan size and the emphasis on land-extensive livestock development probably contributed to an increased concentration of assets, as well as income, in the region. Furthermore, since this activity used little labor and involved, to a certain extent, the conversion of cropland to pasture, the program was also indirectly disadvantageous to the poor rural population. The PROTERRA experience shows what the natural tendencies of the Northeast institutional credit system are, given an injection of highly subsidized credit without crop specification. Any small-farm credit program would need to be highly specified in terms of crop and type of expenditure, in order to go against this natural bias.

B. Livestock Financing

Cattle in a Drought-Prone Environment

150. Traditionally, cattle raising has been strongly complementary with subsistence and commercial crop production. The system is epitomized in the production of cotton. The cotton harvest occurs during the dry season, which leaves the area planted in cotton free for grazing of cattle precisely at the time when natural pastureland starts to dry up. Moreover, cotton ginning yields a by-product, cotton cake, which serves as a cattle feed high in nutrients. Finally, cotton does well in small-scale production units and can be interplanted with short-cycle subsistence crops. It thus also lends itself to small-farmer production and, given the landholding patterns in the Northeast, has been associated with the sharecropping system. The husks of the interplanted corn are also an important source of cattle feed during the dry season. The complementarity of cattle with cotton also lies in cattle's role

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1/ Norman Rask, Richard L. Meyer and Fernando C. Peres, "Credito Agricola e Subsudios a Producao Como Instrumentos Para o Desenvolvimento da Agricultura Brasileira," Revista Brasileira de Economia 28 (January/March 1974), p. 165.

as insurance against the drought. Their mobility allows them to be transferred to the drought-free areas or reservoirs that dot the Northeast; as an asset, cattle can be liquidated at any moment when feed can no longer be provided. 1/ During times of drought, cotton plantings are often allowed to be destroyed by drought starved cattle. Thus, the only drought-resistant plant of significance in Northeast agricultural production falls prey to the drought indirectly, because of the precedence given to cattle. Since most cattle belong to the landowner in this mixed system, he is protected from the effects of drought, while the sharecropper is totally dependent on drought-prone subsistence crops for his consumption and his drought-resistant commercial crop is sacrificed to the landowner's cattle.

PROTERRA Financing of Cattle

151. The type of livestock investment recently financed by PROTERRA credit is to a certain extent different from the usual investment in cattle in the Northeast which was complementary with crop production. Much of the PROTERRA-financed livestock activity is carried out by newcomers to agriculture, on lands converted from crops to pasture, or on newly cleared land devoted exclusively to pasture. This means not only a change in the agricultural production mix, but also a different type of relation between landowner and the farmer who works the land. The owner of cattle lands often makes an agreement with a rural worker which provides neither the stability and protection of the sharecropping relationship, nor the benefits of the salaried relationship. The worker is given four or five hectares of uncleared land to clear and plant with subsistence crops which must be short-cycle (about 90 days -- mainly, corn and beans). After harvesting the short-cycle crops, the worker must leave the plot to the landowner -- either planted in pasture, or ready for planting. If the landowner desires, he directs the worker to move to another plot on his property the next year, repeating the same process. There is no exchange between landowner and worker other than the handing over of the cleared piece of land at the end of the crop cycle. At the end of the land-clearing period, the worker is left with no relationship to the landowner or the land. The tendency toward undiversified livestock farming seems to have been reinforced by the enactment, if not enforcement, of labor and land

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1/ During the drought of 1970, the price of beef rose considerably less than other agricultural foodstuffs (40% vs. 200%) due to the outward shift in the supply curve resulting from increased sales. Carater e Efeitos de Seca, p. 189. The regional economic indices of Conjuntura Economica of prices received by farmers for the states most affected by the drought show the same differences but of less striking magnitude.

	Ceara	RGN	Paraiba	Pernambuco
% Price Increase (1969-1970)				
Crops	65.8	52.3	40.0	21.8
Livestock	11.4	15.8	28.8	18.9

legislation. Although the laws can still be evaded, entrepreneurs are substituting land and (subsidized) capital for labor in the expectation that they will eventually be enforced. 1/

152. Cattle have also played a special role in the banking institutions of the Northeast. Livestock lending is a way for branch managers to reduce their risk. Cattle are particularly desirable insurance against loan default in the Northeast. If the borrower defaults, collection and sale of the asset is easier and surer than in the case of mortgaged crops, or even mortgaged land. The absence of marketing problems is also considered an advantage of cattle loans. The bank manager's concern with minimizing the risk of loss on his loan portfolio is then an important incentive to lending for investment in cattle and pastureland in the Northeast. Since all commercial crops are dependent on institutional credit for their production, this organizational incentive is a strong influence on the production mix of agriculture in the Northeast.

153. The Bank of Brazil at one time encouraged small-farmer loan applicants to include the purchase of a cow or two in their loan proposal -- the Compre-Uma-Vaquinha, or Buy-a-Cow program. 2/ While this approach was considered by some to be a self-interested move by the Bank of Brazil to assure or simplify collection on its loans, the concept appears to make sense for small-farm agriculture in the Northeast. This type of small-farmer lending fits into the banking institution's natural bias toward livestock financing, and at the same time avoids the asset-concentrating effects of that bias. It makes it possible for the small farmer to achieve the same diversification in production that has been crucial to the economic survival of the large share-letting landowner. Finally, limited cattle credit allows the small farmer to acquire assets which might be exchanged in the future for less easily financeable ones. Where access to institutional credit has been nonexistent, small farmers have been observed to treat their cattle herds as relatively liquid noncash assets, available for liquidation when cash was required for innovations of investment. 3/ Cattle, in short, are an important vehicle for peasant saving in an economy where cash savings are vulnerable to inflation, where savings institutions do not exist, and where

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1/ This labor intensive method of clearing cattle land would represent a misallocation of land only in cases where its fertility would permit more or less continued planting in annual crops.

2/ In addition to the Bank of Brazil's program, there seemed to be an informal tendency in the Bank of Brazil, the BNB and some of the extension programs to encourage the small crop farmer to acquire a cow or two.

3/ Eric Clayton, Agrarian Development in Peasant Economics: Some Lessons from Kenya ((Oxford: Pergamon Press), 1964, pp. 131-132, as cited in J.D. Von Pischke, "A Critical Survey of Approaches to the Role of Credit in Smallholder Development," Institute for Development Studies, University of Nairobi, April 1974, p. 15. Trees are also cited as a noncash form of assets. When the small farmer requires cash for an investment, he may sell trees in situ or convert them into charcoal.

other forms of noncash savings are out of the poor man's reach. A small-farm cattle-financing program, then, is a form of risk-averting banking behavior which can have a positive impact on small-farmer development. Financing the acquisition of cattle in small-farmer loans also dissociates livestock lending from land ownership. The large-scale livestock lending of the PROTERRA program, in contrast, goes along with the accumulation of land assets as well as livestock.

154. Dairy cattle in particular might be well suited to this type of program. Dairy cattle farms tend to be small in Brazil. For example, 88% of the dairy enterprises in Sao Paulo produce less than 100 liters a day and account for 40% of the production. 1/ Diversifying small-farm agriculture with dairy cattle makes some sense and would fit into the Brazilian Government's production-oriented goals for agriculture. There is presently a deficit of milk production in the Northeast. Though the Northeast cattle herd represents 20% of the Brazilian total, milk production accounts for only 10%; the milk deficit for the region is estimated to reach 1.7 billion liters by 1980. 2/ Finally, the sale of milk provides small farmers with a continuous stream of cash throughout the year, as well as a costless source of milk supply for his household, reducing the need to resort to short-term financing or cash advances from the landlord to meet family consumption needs.

155. Small-scale milk production, of course, may be more susceptible to marketing problems because of its perishability and dispersed location. Milk production, however, has been one of the few areas where cooperative organization has consistently done well. A reincarnated version of the Bank of Brazil's Buy-a-Cow program, in sum, might be desirable on several grounds:

(a) it would help give the small farmer protection against the drought;

(b) it would provide the small farmer with access to institutional credit for his crops;

(c) it would support an activity which has proved suitable to small-scale production and at the same time not attractive to large farmers;

(d) it would help alleviate the Northeast milk deficit; and

(e) it would improve the nutrition of the small farmer's family.

1/ All data in this paragraph from "Pecuaria Leiteira," Conjuntura Economica, June 1974, pp. 105-107. Northeast and Brazil herd size comparisons from Anuario Estatistico do Brasil 1971, pp. 160-161.

2/ The PROTERRA-financed cattle acquisitions were certainly not weighted toward dairy cattle. In 1972 and 1973, beef cattle represented 83% of these acquisitions and dairy cattle 17% (Table 35).

Table 34: BANK OF BRAZIL - 2nd REGION. PROTERRA-FINANCED CATTLE ACQUISITION, 1972-73 (NUMBER)

	1972	1973
Beef Cattle		
Breeding bulls	11,978	11,817
Breeding cows	94,550	170,382
Fattening steers	484	2,246
Calves	31,585	41,373
Steers for feedlot fattening	15,712	43,544
Imported high grade breeding cattle	512	499
Subtotal	154,821	269,861
Dairy Cattle		
Breeding bulls	1,147	1,684
Breeding cows	31,290	50,086
Imported high-grade breeding cattle	167	157
Subtotal	32,604	51,927
Total	187,425	321,788
Beef as % of total	82.6%	83.8%
Dairy as % of total	17.4%	16.1%

Source: Bank of Brazil Directorate, 2nd Region.

C. Small-Farmer Lending in the Northeast

The Bank of Brazil's Role in Financing of Small Farmers

156. The Bank of Brazil, which accounts for 80% of institutional rural credit in Northeast Brazil, is the only public institution with substantial experience with small commercial farmers all over the region. The Bank has pursued a policy of being receptive to small-farmer loan requests, and is concerned about the share of its total portfolio in small loans. In 1972, 83% of the number of crop loans and 20% of their value were less than 25 times the minimum wage (Cr$6,720). For livestock loans, the shares were 60% and 14% (Table 36). The aggregate averages conceal the fact that many of the Bank of Brazil's dispersed network of 160 Northeast branches predominantly deal with small loans. This is especially true in the Agreste where small properties are more common, in contrast to the coastal zone where commercial cultivation prevails and bank branches specialize in larger loans. 1/ The share of the number rather than value of small-loan contracts in the total portfolio may be a better indicator of the time branch managers spend dealing with small-farmer matters since processing time is not a function of loan size. If this is true, then a majority of the Sertao and Agreste branch bank's time is spent dealing with small-farm matters, even though the share of such loans in their portfolio is small.

157. In addition to the Bank of Brazil's considerable exposure to and experience with small farmers in the Northeast, the geographical dispersion of the Bank's operations makes it a particularly apt vehicle for channeling small-farmer credit. Moreover, substantial discretion is left to the branch manager in making loans less than 50 times the minimum wage, so that his familiarity with the area can play an important role in lending decisions. This can substitute for the more formal requirements of loan granting and supervision, which often exclude the small farmer or discourage him.

158. Despite their broad experience with small-farm credit, bank managers and directors tend to look upon such credit as serving mainly distributive ends. There is little interest in the production- or productivity-increasing potential of the credit. As a result there is a lack of technical assistance or cooperation with extension agencies in the administration of small-farm credit; an absence of interest in, and therefore, data on, small-farmer production response patterns to changes in credit supply; and a lack of guidelines on specific crops suitable for small-farm agriculture (though individual managers sometimes take the initiative in this matter).

1/ For example, the average size crop loan contract for the Bank's Northeast operations has been Cr$8,000 in 1972 constant cruzeiros. In three branches of the Pernambuco Agreste, however, the average loan size was considerably less -- about Cr$5,000 in Garanhuns, Cr$2,000 in Surubim and Cr$3,000 in Arcoverde (Table 36). All these averages are less than 25 times the minimum wage (Cr$6,720 in 1972 at a minimum wage of Cr$268.80).

Table 35: BANK OF BRAZIL - 2nd REGION, LOANS BELOW 25 TIMES MINIMUM WAGE IN 1972/1

	Contracts		Value	
	No.	% Total	Cr$ million	% Total
Crops	97,395	83.0	189.0	19.8
Livestock	18,674	60.2	58.0	13.9

/1 Minimum wage - Cr$268.80 as of May 1. Minimum wage x 25 - Cr$6,720.

Source: Based on data from Bank of Brazil Directorate - 2nd Region.

Table 36: BANK OF BRAZIL - GARANHUNS, SURUBIM AND ARCOVERDE BRANCHES, PERNAMBUCO RURAL CREDIT (LOANS GRANTED)/1

(1972 Cr$ thousand)

	Crops			Livestock		
	No. of contracts	Value	Average contract	No. of contracts	Value	Average contract
Garanhuns						
1971	1,475	3,398.8	2.3	517	7,438.3	14.4
1972	1,270	7,939.0	6.2	450	6,191.0	13.8
1973	1,102	4,155.0	3.8	352	6,356.4	18.2
Surubim						
1971	807	1,358.0	1.7	473	3,827.2	8.1
Arcoverde						
1974/2	1,363	5,941.1	2.6	1,200	9,007.3	7.5

/1 Deflated by FGV index of prices received by farmers.

/2 As of May 30, 1974. Deflated by index number for February 1974.

Source: Garanhuns: Garanhuns Branch.
Surubim: Claudia Guimarães, Posse e Uso da Terra: Relações de Poder e Conservadorismo Camponês, Master's Thesis, Integrated Program in Economics and Sociology (PIMES), Federal University of Pernambuco, Recife, 1973.
Arcoverde: Arcoverde Branch.

Table 37: BANK OF BRAZIL - 2ND REGION RURAL CREDIT BY CROP, 1972-73/1

(Current Cr$ million)

	1972		1973	
	Value	%	Value	%
Cotton/2	201.7	34.1	263.9	31.4
Rice	13.2	2.2	13.5	1.6
Cocoa	54.2	9.1	87.9	10.5
Sugarcane	220.2	37.2	335.4	39.9
Beans	32.1	5.4	54.1	6.4
Tobacco	13.6	2.3	24.6	2.9
Manioc	20.9	3.5	17.5	2.1
Corn	35.8	6.1	43.2	5.1
Total	591.7	100.0	840.1	100.1
Total crop credit	915.2		1,257.0	
% of total crop credit	64.7		66.8	

/1 Not all crop credit in Bank of Brazil printouts is designated by the type of crop. This table represents all credit designated by crop of the most important crops financed -- which accounts for about 65% of total crop credit. Most of the credit represents working capital credit, except for cotton and sugar where investment accounts for a considerable share. For cotton, minimum price credit accounts for about 35% of the total.

/2 Includes Cr$33.3 million for investment credit for crop formation in 1972 and Cr$46 million in 1973. Cotton is the only crop in this list for which crop formation investment credit appears.

Source: Based on data from Bank of Brazil, Directorate - 2nd Region.

159. Bank of Brazil managers and functionaries consistently report that small farmers repay their credit well. Indeed, some say that small-farmer repayment rates are higher than those of large farmers because the latter have the economic power to neglect repayment whereas the small farmers are afraid to do so. 1/ Because of this, the Bank of Brazil, after surveying small-farmer repayment rates in 1964, decided to terminate a policy of restricting such credit. The previous policy set a ceiling (limite de risco) for small-farmer credit, which was determined by the head office after request by the bank managers.

Lessons from the Bank of Brazil Small-Farmer Experience

160. The Bank of Brazil has gradually introduced certain lending concepts which could be important elements of any full-fledged small-farmer credit program. For example, it has accepted the concept of consumption lending to small farmers under the loan category "sustenance of the producer" (manutencao do produtor). This category was adopted after the drought of 1970, because it was felt that the self-sufficient family producer was discriminated against because he didn't need to employ others, and didn't qualify for credit to help sustain himself and his family, even though they were providing the labor for his production. Even though the share of such loans is an insignificant part of the total -- 1% of the loans made in 1972 and 0.15% of their value -- the acceptance of the concept of financing consumption is important. 2/

161. The Bank of Brazil, unlike many lending institutions, has adopted procedures to lend to farmers without title to their land. Though it usually requires a written rental contract for tenant farmers, it often waives this requirement for financing of less than three years duration. In such cases, the Bank will often lend to tenant farmers and sharecroppers upon presentation of a letter of permission from the landowner (carta de anuencia). The permission does not obligate the landowner as guarantor, but gives the Bank the legal

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1/ The Arcoverde branch of the Bank of Brazil reported a repayment rate of 95% for crop loans, which are mainly to small farmers, and 80% for livestock lending, mainly large farmers. The Bank of Brazil has no data available on repayment rates according to loan size. In 1958, 1962 and 1964, the Bank solicited such data from its agencies with respect to "small producer" loans. It reported that the repayment rates were satisfactory on all three occasions. Carta-Circular No. 5,213 of October 1, 1964, General Directorate of the Bank of Brazil.

2/ The amount of credit under this rubric is often calculated as a residual. The Bank normally finances 50 to 60% of the anticipated value of the farmer's crop, and if the sum of his anticipated input costs does not equal that amount then the rest can be made up with "sustenance" costs. "Sustenance" expenditures were part of 1,771 loan contracts in 1972 amounting to Cr$ 1,963,625. The average sustenance financing was Cr$ 1,109 -- equal to a little more than four times the minimum monthly wage of that year (Cr$ 268.80). Based on data from Bank of Brazil, Directorate, 2nd Region.

authority to deal with the tenant on the owner's land. The loan is guaranteed by a lien on the crop or the co-signing of a friend. The share of such contracts in total Bank of Brazil lending in the Northeast is not known, though the Garanhuns and Arcoverde branches in the Pernambuco Agreste reported that 30% to 60% of the contracts in certain counties were with sharecroppers or renters. In Fortaleza, one branch is financing 400 tenant farmers in an irrigated area. Bank of Brazil officials claim that processing a small loan costs just as much time and effort as a large one. No studies have been made of this but various expediting measures for small loans have been introduced through the years, such as the waiving of certain guarantees and notarized documents, which must have had some effect on lowering unit cost.

162. Finally, the Bank of Brazil has experimented with small-farmer programs and in the process has accumulated some knowledge about how they work. The Bank of Brazil sponsored a "mobile credit" program in the early and mid-1960s, which attempted to rapidly increase the number of loans to small farmers. To achieve this increase in the flow of small-farm credit and its dispersion, the Bank of Brazil operated quite differently than it normally does. Bank personnel were sent into small interior towns to hold meetings publicizing the availability of credit. Loans were made for six-month periods for working capital needs for subsistence crops, guaranteed with a lien on the crop. Though there are some differences of opinion about the value of the program, it has been reported that it often resulted in increases in production due to increased area planted; and that some beneficiaries of the credit were able to buy land for cash out of their increased income. Unfortunately, no data exist on the operations of the program.

163. Another experimental program involved financing linked with technical assistance to cotton farmers in 1967 and 1968. The program was not particularly aimed at small farmers but ended up largely benefiting this group. Since large farmers relied on sharecroppers for most of their production, they were not interested in such assistance. Thus, the program's users turned out to be the small-to-medium landowners who relied mainly on their own labor. 1/ This program illustrates one possible approach to the problem of providing production subsidies to a low-income group in a way that discourages their appropriation by those with greater economic and political power. This particular subsidy was structured, inadvertently, in a way that made it uninteresting to large producers since it was tied to technical assistance for a crop whose production was not in their hands.

1/ Escritorio de Analise Economica e Politica Agricola (EAPA/SUPLAN) Aspectos Socio-Economicos da Cultura de Algodao Arboreo, Ministry of Agriculture, Brasilia, 1972. p. 21.

Suggestions for Orienting Credit to Small Farmers

164. Proper selection of crops financed can contribute to assuring that financing provided in a small-farm program is not preempted by larger farmers. Beans, corn, manioc, and to a lesser extent rice are produced widely by small rather than large farmers in Northeast Brazil. They are almost totally associated with the poor Northeast peasant, and their cultivation is considered socially unacceptable by many large farmers. 1/ These crops, moreover, account for 31% of the value of crop production in the Northeast and 42% of the area cultivated (Table 39). Beans and corn are likely to continue having considerable importance for low-income producers for some time in the Northeast, not only because they are subsistence crops, but because they are short cycle. The structure of the production and credit system in Northeast Brazil locks the poorest producers into the production of short-cycle crops. The division of production on a large property between livestock on the part of the landowner and crops on the part of the tenant depends on short-cycle crop production which allows the cattle to pasture on the crop fodder during the dry season. Land clearing operations for pasture also allow only short-cycle crop planting by the land clearers. In general, the short-cycle of a crop is a landowner's hedge against a tenant putting down roots in his land. The sharecropper, tenant farmer and occupant are traditionally prohibited from planting perennial crops because they are considered fixed real property, and if the tenant is expelled, he has the legal right to indemnification for this property. In some areas, the tenant farmer is allowed to plant herbaceous cotton but not arboreal cotton because the former has a shorter two-year cycle, the time period of most rental agreements. Even manioc is prohibited in some areas by cattle-ranching landowners because although it is not a perennial, it occupies the land during the dry summer, when the cattle are grazed on the harvest leavings of cotton, corn and beans. Ironically in this case, the "subsistence crop" manioc can be planted only by the owner of the land. 2/

1/ In the case of beans, even consumption is categorized by class. The Northeast upper classes do not buy the type of beans produced and consumed by the Northeast peasant -- feijao de corda. They prefer another more expensive variety, feijao mulatinho, imported in large part from the southern part of the country. In contrast to the peasant foodstuffs, meat and milk are thought of as the "noble" foodstuffs. See, for example, Ministry of Agriculture, II Plano Nacional do Desenvolvimento 1975-79, Projetos Prioritarios, Brasilia, draft, unpaged. Also, "Pecuaria de Corte," Conjuntura Economica, June 1974, p. 108.

2/ The constraints on the peasant farmer with respect to short-cycle crops are not limited to the traditional farming sector. They emanate from the agro-industrial sector as well, including the more modern of its firms. A large tomato factory in the Agreste of Pernambuco, for example, doesn't allow the planting of manioc by its sharecroppers because, among other things, its cycle is longer than the three to four months of corn and beans. According to the company's sharecropping contract, the sharecropper must plant only short-cycle crops in the area reserved for subsistence crops, so that after the harvest, the company's cattle can graze in the area for two or more months until the beginning of the next planting season. Plano de Parceria Agricola de Industrias Alimenticias Carlos de Britto S/A (Fabricas "Peixe") Para a Agroindustria do Tomate de Pesqueira," Item (2), n.d.

Table 38: NORTHEAST BRAZIL (9 STATES) VALUE OF CROP PRODUCTION, AREA PLANTED AND CREDIT FOR PRINCIPAL CROPS, 1972

Crop	Value		Area Planted		Credit/1	
	Cr$ million	% of total	1,000 ha.	% of total	Cr$ million	Credit as % of output
Cotton	867.4	13.0	3,233.2	28.0	116.8	13.5/2
Rice	442.0	6.6	892.1	7.7	38.6	8.7/2
Sugarcane	913.5	13.6	661.4	5.7	237.5	26.0/2
Beans	707.3	10.6	1,639.9	14.2	43.4	6.1
Tobacco	106.3	1.6	78.7	0.7	n.a.	n.a.
Castor bean	217.0	3.2	263.4	2.3	n.a.	n.a.
Manioc	887.1	13.3	1,033.0	8.9	24.6	2.8
Corn	465.3	7.0	2,192.2	19.0	41.7	9.0
Cocoa	496.3	7.4	406.4	3.5	50.5	10.2
		76.3		90.0		
Total	6,695.2		11,550.8			

/1 Total rural credit of the public banking system, including marketing. Bank of Brazil accounts for about 80% of the total.

/2 Large discrepancies between these shares and those of Table 38 due to the following: for sugarcane and cotton, Table 38 data identifies more investment credit by crop than this data source, and investment credit is significant for these two crops; for rice, Table 38 excludes the states of Maranhão and Piaui, where rice production is most important.

Source: Based on data from Ministry of Agriculture, EAGRI/SUPLAN.

165. Institutional credit sources also tend to encourage production of short-cycle crops. Banks are reluctant to extend financing for a longer period than that encompassed by a short-cycle crop, or for production methods with relatively high working capital costs. The Bank of Brazil, for example, will often finance the working capital costs of tenant farmers with a written contract or a letter of permission from the landowner. It will not do so for tobacco-planting tenants, however, because tobacco's working capital costs are relatively high. The tenant in this case would still produce tobacco, but would be dependent on the tobacco intermediary (the comprador) for credit, advanced to him at the higher rates of the noninstitutional credit market. Similarly, the Bank will not finance the tenant who cultivates sisal or agave, because it is a perennial crop, and the farmer's tenure is precarious. Hence, a poor farmer with the initiative to introduce a change in his production techniques, or in the mix of crops he plants, or to change from subsistence oriented to market-oriented production, will often find that he cannot obtain financing from the banking system.

166. The fact that beans and corn are subsistence crops, then, does not by itself explain their dominance of Northeast low-income production; nor does a "subsistence mentality," as opposed to the "exchange" one -- describe their producers. After all, many small producers live so close to the margin of subsistence that they cannot afford to stock their own production for consumption throughout the year. They must sell their beans and corn immediately after harvest, and "buy them back" on credit later on. They thus have "advanced" to being market rather than subsistence producers, but under the worst circumstances. They sell their produce when prices are down and buy it back when they are up. The prevalence of bean and corn production reflects to a certain extent the severe institutional barriers to planting anything else.

167. Any credit-extension-research program concentrating on short-cycle crops could benefit a substantial part of the Northeast's peasants, while being unattractive to large producers. Any resulting improvement in the productivity of these crops would have a substantial impact on Northeast agricultural product because of their importance in regional output. However, because larger farmers have not been interested in producing these crops, there has been little research or extension activity devoted to them. Marginal inputs of research and extension are, therefore, likely to have substantial results. Finally, as Center-South agriculture becomes increasingly export oriented, and the opportunity cost of growing crops for local consumption on these lands increases -- the Northeast might take over the production of domestically consumed food products like corn and beans. The heavy investment by the Brazilian Government in transport infrastructure linking the Northeast with the rest of the country makes such specialization a possibility.

168. The banking system is a powerful institutional influence on the pattern of small-farmer production. Changes in banking practices could, therefore, have a significant impact on small-farm productivity. A small-farm credit program could accomplish quite a bit if it allowed farmers to

decide on crop and factor mixes according to market considerations, in contrast to the non-optimal production decisions now being made because farmers are locked into short-cycle crops, or high-cost sources of credit. Such a credit program might be limited to small-farmer production activities not currently financed -- mainly, longer-cycle crops or crops with higher working capital costs. The experience of the Bank of Brazil has shown that small farmers and non-landowners can be creditworthy borrowers. What is needed is an incentive for banking institutions to manage their credit programs in a way that facilitates rather than constrains the advancement of the small farmer. A crop-credit insurance system, for example, would go a long way in reducing the bank's resistance to lending to small farmers because of their vulnerability to crop failure. Some type of subsidy incentive to small-farmer credit programs might be introduced, such as a Central Bank rediscount facility with a larger spread for small-farmer loans.

The Bank of Northeast and Small Farmers

169. The Bank of Northeast has 70 branches in Northeast Brazil and is less involved in small-farmer credit than the Bank of Brazil. Its deposits have increased much more slowly than those of the Bank of Brazil, and this has led to the decrease in its share of Northeast agricultural credit from around 30% in the 1960s to 18% by 1973. The Bank of Northeast made a study in 1970 of the costs of small loans and found that it was not profitable to process loans less than 50 times the minimum wage. 1/ Between 1968 and 1971, therefore, the Bank of Northeast ceased lending to 11,000 of its 19,000 clients who had been borrowing amounts less than 50 minimum salaries. At the same time, the number of loans in the largest size category, above 1,500 minimum salaries more than tripled. 2/ The Bank decided to service small farmers through cooperatives instead of directly. The Bank now works with 100 cooperatives, most of them involved in the marketing of cotton. In accordance with its policy of providing technical assistance to cooperatives, it has had four staff working full time with individual cooperatives for the last two years, and plans to send out six more in 1975 and ten more in 1976. The Bank of Northeast has only 15 staff who work on the supervising of cooperative credit.

D. Cooperatives and Small Farmers

Obstacles to Cooperative Development

170. While cooperatives were often mentioned as a useful approach to small farmer problems, these institutions had not received concrete government support. 3/ The success of the cooperative movement in the Northeast

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1/ Cr$ 15,600 at the 1973 minimum wage of Cr$ 312 and Cr$ 18,840 at 1974 minimum wage of Cr$ 376.80.

2/ Dale Adams, "Rural Financial Markets and Farm Level Capital Formation in Brazil," Chapter 10, First Draft, July 25, 1974, p. 37.

3/ This is evidenced in the very weak support that has been given to the now virtually decapitalized National Cooperatives Bank.

has been spotty. A sampling of Bank of Northeast-financed cooperatives in the Recife and Surubim branches in Pernambuco showed that in six of the twelve cooperatives with which the Recife branch had been working, operations had been suspended because of corrupt administrative practices; of the seven financed by the Surubim agency, six were suspended. In most of these cases, moreover, the problem was not one of defaults by members of the cooperative, but of misuse of funds by the directorship. Most members had good repayment records, similar to those the Bank of Brazil experienced with small-farmer repayment records. Though the experience in Recife and Surubim may not be representative of the Northeast, it does cover 20% of the number of cooperatives financed by the Bank of Northeast and indicates the precariousness of this institutional form.

171. A strong political commitment to the cooperative approach would require the modification of several aspects of tax and administrative regulations which put such organizations at a disadvantage. By law, the cooperative is not considered a "sociedade de capital", or corporation, and therefore is not subject to income tax, although the individual members are. This tax status deprives the cooperative of various subsidies available to the private sector -- e.g., partial exemptions from the value-added tax, subsidies for the importation of capital goods, greater opportunities for credit, etc. The change in the tax system in 1966 which introduced the value added tax and eliminated the transactions tax (Law 5, 1762 of October, 1966) adversely affected cooperatives. Before this change, they had enjoyed special tax treatment from various states, such as exemption from the sales tax, and some had even received a share of the transactions tax. The new tax legislation deprived them of this special status. Thus, when collection of the value-added tax began, many members of marketing cooperatives deserted them in favor of other marketing outlets accustomed to evading such payments. In general, cooperatives are one of the few types of enterprises in Brazil unable to evade the payment of indirect taxes. To a certain extent, the Brazilian Government has recognized the problems caused by the change in the tax system, and has been attempting to lessen the cooperative tax burden.

172. Although cooperatives can sometimes obtain bank financing before the first rains of winter and in time for planting, they are reluctant to pass such financing to their members. Since the first rains can start several weeks after the beginning of the planting season, the member is forced to take noninstitutional credit at high rates of interest until his cooperative financing is available. This practice defeats the purpose of the cooperative by indebting the farmer excessively, and leaving him dependent on high-cost credit intermediaries. It also lessens the creditworthiness of the small farmer, when he finally does take an institutional loan. 1/ The cooperative-associated small

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1/ The Cazajeiras agency of the Bank of Brazil sponsored a study in 1967 of its delayed loans. It found that the incidence of arrears or default was closely related to the degree of delay in disbursing the loan -- i.e., the amount of time that had elapsed between the planting period and the first loan disbursement. Where the delay was considerable, the borrower was forced to take non-institutional credit from intermediaries and sell his crop at discount before harvest. This made it difficult to repay his later Bank of Brazil credit on time.

farmer is often doubly disadvantaged in getting institutional credit since he has to face the risk-averting disbursement procedures of two organizations to get his credit, rather than just one. This problem might be dealt with in a variety of ways. The rating system of the bank manager could be changed so that he is not penalized for the losses occurring from late or sparse rains. The rating system could even be modified to include a variable having to do with the promptness of loan disbursements in relation to the planting season. The cooperative could also be required to onlend to its members in accordance with the rhythm of planting rather than rains. Again, a crop credit insurance would remove a large part of the risk of default due to crop failure.

173. One of the most serious problems of marketing cooperatives is that, in contrast to other intermediaries, they cannot pay their members immediately for the production they acquire. 1/ This problem arises from legislation (Law 5,764) which defines the cooperative's acquisition of member produce as a "cooperative act" and not a purchase and sale in the market. Because of this definition, the cooperative cannot get credit for payment in advance of resale. As a result, it can only reimburse the farmer fully when his production is resold, which can be several weeks or months later, especially when the cooperative processes or stores the product. (In the case of cotton, the product is handed over by the farmer from August to November and he is fully paid only in April). Since the low-income farmer by definition lives on a small margin, it makes more sense for him to sell his product at a lower price for immediate reimbursement to the marketing intermediary. The cooperative, in effect, is getting "forced" working capital credit from its members in the form of the interest they forego on the delayed payment. This payment problem works not only to the disadvantage of the poorer farmer, but also undermines the cooperative's ability to compete supply sources away from other intermediaries and to gain the organizational power that is needed to challenge the control of existing intermediaries over local market structures. This problem, it seems, could be dealt with through fairly simple change in banking regulations. Since marketing is the one area where cooperatives often do well, 2/ it is important to remove such major obstacles to operation.

Lessons of Cooperative Experience

174. There are a number of cooperatives in the Northeast which have achieved certain success -- mainly, the cotton cooperatives of Ceara and Rio Grande do Norte, the tobacco producers of Alagoas, the orange producers of Sergipe and the bean producers of Bahia. There seem to be particular crops,

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1/ This problem was described at great length by a report of the Bank of Brazil with respect to the cotton marketing cooperatives in Ceara. Mailson Ferreira da Nobrega, "Cooperativas no Estado do Ceara," DINOR-72-195, Banco do Brasil, July 31, 1972.

2/ Thomas F. Carroll, "Group Credit for Small Farmers," Small Farmer Credit Analytical Papers, AID Spring Review of Small-Farmer Credit, Vol. XIX, June 1973, p. 275.

production structures and institutional relations in which cooperatives work better. If cooperatives are to be an effective way of reaching small farmers, more needs to be known about the Northeast cooperatives that have worked well, so that preconditions for success can be identified.

175. The case of cotton cooperatives of Ceara carries interesting lessons. Fifteen processing and marketing cooperatives in the state of Ceara -- and one in Rio Grande do Norte -- are tied together through a central cooperative in Fortaleza -- the Central Cooperative of Cotton Growers. The Central Cooperative arranges for the marketing of ginned cotton, and also gins the cotton of the six cooperatives which don't have their own equipment. The system is financed by the Bank of Brazil and the Bank of Northeast, and the Bank of Brazil has two functionaries working full time in the Central Cooperative. The Central Cooperative was created in 1971, and by 1974 the system represented 15,000 members and processed 12% of the state's cotton, the second largest ginning group in the state. Its members received a price 28% higher than the average.

176. The origin of the cotton cooperative system owes much to the Bank of Brazil which reactivated a cooperative so that it could rent the gin of a bankrupt borrower and pay off his debt and ultimately own the operation. The Bank of Brazil seconded a full-time functionary to revitalize the cooperative, and SUDENE eventually approved financing for outright purchase of the equipment with subsidized credit funds of an Inter-American Development Bank loan. The scheme worked and when, a few years later, the Bank was faced with the same problem on a much larger scale -- the bad debts of 12 cotton gins -- the same solution was tried. The Bank of Brazil assigned another full-time functionary to the cotton cooperatives, and encouraged the founding of the Central Cooperative in Fortaleza. By 1974, the cotton cooperative system was the Bank of Brazil's largest client in Ceara, accounting for Cr$100 million of its outstanding credit. The active participation of the Bank of Brazil was probably critical to overcoming the resistance of the local intermediaries to the cooperatives.

177. The small-scale, dispersed nature of much of the ginning industry made it a logical activity for cooperatives. The location of the processing installation in the cotton producing areas made it a natural gathering point for farmers producing the raw product. Had the processing installations been far away, or had the product been such as to allow processing on each individual property, as in the case of manioc flour or sugarcane, processing and marketing would not have provided a single point at which growers would naturally gather. Hence, the industrial structure dictated by this crop and the decentralization of ginning in the Northeast, made it natural for producers to form marketing, rather than production, cooperatives. Cooperatives that have focused on the marketing process have, in general, been less prone to failure than production-oriented ones. Moreover, many localities were served by one gin, so that once a local cooperative took over, it would not compete with other ginners. The local monopoly settings allowed the cooperative some time and room to build up its strength. Finally, the local monopoly of the small gins meant that their failure could jeopardize the

marketing possibilities of all the cotton farmers served by them and, likewise, might cause default on the credit extended to them. The Bank's cooperative-sponsoring actions, then, were based not only on concern for the failure of the ginner but also its impact on the cotton producers and the possibility of losses in their debt to the Bank. (Cotton is the second most heavily financed crop of the Bank of Brazil in the Northeast, representing 34% of the Bank's crop credit and 24% of the value of the crop.)

178. The production of cotton encompasses a wide size-range of producers from large holdings using sharecroppers to medium and small producers which use few or no sharecroppers. 1/ The mixed nature of the beneficiaries of the cotton cooperatives may be one of the causes of their initial success. While it was the smaller owners who availed themselves of the cooperative marketing program, even the largest landowners producing through sharecroppers participated, at least to some extent, in the cooperative, availing themselves of the credit onlent through the cooperative. Because of this participation, the cooperative's existence was not threatened by their opposition. Although the cooperative development brought significant benefits to the small cotton landowners, it probably brought no improvement in the conditions of cotton sharecroppers. 2/ Landowners have in many cases refused to give the letter of permission required by the Bank of Brazil for sharecropper access to cooperative credit. Since the large landowner is usually tied into non-cooperative marketing systems, it is not in his interest to have his sharecropper market directly through the cooperative.

179. Now that the cotton cooperatives have gained some strength in Ceara and Rio Grande do Norte, the system may be able to encourage the inclusion of sharecroppers. A credit program aimed at incorporating sharecroppers into the cooperative structure could accelerate this process. This could involve a land purchase credit scheme. Many large landowners in the cotton region, who might otherwise be expanding their production, have decided not to do so because it would involve taking on more sharecroppers -- something they don't want to do because of expectations about enforcement of land and labor legislation. 3/ These actions could mean that landowners might respond favorably to the possibility of selling excess land under a scheme which guarantees their compensation. This would be an infinitely better solution than the

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1/ Ministry of Agriculture, Aspectos Socio-Economicos da Cultura de Algodao Arboreo, Brasilia, 1972.

2/ "The Cotton Cooperative System in Ceara," EAPA/SUPLAN, Ministry of Agriculture.

3/ This was reported for the Quixada region in Aspectos Socio-Economicos da Cultura de Algodao Arboreo, p. 15.

conversion of sharecropped land to cattle and the expulsion of the sharecropper -- a particularly attractive alternative to large landowners, given the subsidies of PROTERRA credit. 1/

180. The success of the cotton cooperative experience points up the fact that the institutional form of the cooperative is less important to its viability than is the pattern of production, marketing and processing of the crop involved. More importantly, it points up the critical requirement of active and creative support from a powerful governmental agency. In this case, the driving force was the innovative extension activity by the Bank of Brazil, combining credit with facilities for processing and marketing and assigning to the project some of its best technical staff.

E. Small-Farmer Credit and Productive Efficiency

181. Examination of the available data suggests that a program channeling credit to the small-farm sector in the Northeast could possibly affect more than half of total output of the region, and might be even more productive than the same credit channeled to the large-farm sector. In the five states of the "core" Northeast (Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, and Sergipe), farms under 50 hectares represent 92% of the total number but only 25% of total farm area. Despite this small share of total area, these farms accounted for 49% of crop area, 38% of the cattle herd, and 80% of labor employed. Given their tendency to work land more intensively than on large farms, the smaller farms probably produced more than half of the volume and value of crops. They also probably generated close to half of the value of livestock output since they have a relatively higher proportion of dairy cattle. Furthermore, analysis of production data for cotton in Ceara and Pernambuco, sugarcane in Pernambuco and Alagoas, and cattle in Ceara (Table 41) indicates that except in the case of cotton in Pernambuco, small farms oriented to commercial production have a higher marginal product for intermediate inputs than does the large farm sector. While this type of small farm is, admittedly a special case, this result contradicts the notion that marginal product for financed inputs would be lower on small farms due to their lack

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1/ Such conversion of cotton lands to pasture has been already occurring, not only because of discomfort with labor but because of the lower productivity of cotton, increases in cattle prices with respect to cotton (see below), and the development of improved grasses like the capim pangola, which dispenses with the need for cattle for PROTERRA credit. Manuel Correia de Andrade, A Terra e O Homen no Nordeste, Third Edition (Sao Paulo: Editora Brasiliense), n.d., p. 171. Also reported for Rio Grande do Norte in Comissao Estadual de Planejamento Agricola (CEPARN), Estudos Basicos Para a Formulacao de Programas de Desenvolvimento Agropecuario no Estado do R.G.N., Vol. 4, Natal, n.d., p. 38.

of land. The apparent explanation for the finding is that the more intensive utilization of labor on the small farms more than offsets the smaller availability of land. Thus, a program channeling credit to these farms for purchase of productive inputs could have a marginal productivity at least as high as that which could be obtained channeling the credit to larger farms if appropriate technological packages could be developed for other crops as grown by small farmers.

182. Available evidence indicates that institutional credit to Brazilian agriculture is in such adequate supply for those with access to it that its marginal efficiency is quite low, 1/ and there are reports that much of the subsidized agricultural credit in Brazil is diverted to nonagricultural activities with higher returns. Thus, it would be difficult to bring about significant changes in agricultural productivity through new subsidized credit programs that operate in the same way as those in the past. Since marginal returns to credit use among small farmers appear to be higher than those for large farmers, or for those who already have adequate access to institutional credit, reallocating a part of the credit to the smaller producers should stimulate an increase in agricultural productivity.

F. Implications of Rural Development Programs

183. Experience has shown that credit programs which are not channeled through institutions which will assure that an adequate share reaches small farmers will inevitably be dominated by large farmers. Ideally, therefore, either credit institution specializing in small farmers or an independent unit of the Bank of Brazil or Bank of Northeast should handle financing of these producers. Another alternative would be to make funds available to a particular target group, as within the context of integrated rural development projects. In this respect, POLONORDESTE, which expects to reach 100,000 families, is an encouraging beginning. However, unless new institutional arrangements are devised, an indirect approach may have to be used to assure a broader distribution of credit to small farmers. For example, rural development projects might emphasize crops like beans, corn and manioc, in which large farmers have little interest, counting on the structure of production, rather than administrative regulations and government commitment, to keep large farmers from preempting credit provided by such projects. Credit operations are designed to benefit small farmers but which at the same time fit into the biases of traditional banking institutions in the Northeast, would seem to have a better chance of success. Diversifying small-farm loans by financing cattle would accommodate these biases, turning them toward asset-distributing rather than asset-concentrating results. Dairy cattle, in particular, might be well suited for such an approach.

184. The bias against small-farmer lending could be lessened by altering the organizational incentive structure that feeds it. The practice of withholding credit disbursements until the coming of the rains is not officially sanctioned by the Bank of Brazil, and yet the performance rating system for its managers makes such behavior rational. Loans made under a

Table 39 : RELATIVE IMPORTANCE OF THE SMALL FARM SECTOR IN FIVE NORTHEASTERN STATES

States	Farm number (1,000)	Land area (1,000 ha)	Crop area (1,000 ha)	Labor force (1,000)	Cattle (1,000 head)
A. Totals					
Rio Grande do Norte	104	4,602	776	315	604
Paraiba	170	4,600	1,183	613	865
Pernambuco	332	6,412	1,463	1,157	1,190
Alagoas	105	2,236	428	440	482
Sergipe	96	1,751	202	276	615
Total	807	19,601	4,052	2,801	3,756
B. Farms under 50 hectares					
Rio Grande do Norte	90	767	288	224	174
Paraiba	154	1,175	555	493	318
Pernambuco	309	1,823	785	945	537
Alagoas	98	649	252	345	184
Sergipe	90	502	111	242	196
Total	741	4,916	1,991	2,249	1,409
C. Farms under 50 hectares as % of total					
Rio Grande do Norte	86.5%	16.7%	37.1%	71.1	28.8
Paraiba	90.6	25.5	46.9	80.4	36.8
Pernambuco	93.1	28.4	53.7	81.7	45.1
Alagoas	93.3	29.0	58.9	78.6	38.2
Sergipe	93.8	28.7	55.0	87.7	31.9
Total	91.8	25.1	49.1	80.3	37.5

Source: Agricultural Census of 1970.

Table 40: RELATIVE MARGINAL PRODUCTIVITY OF INTERMEDIATE INPUTS ON SMALL VERSUS LARGE FARMS: SELECTED NORTHEASTERN PRODUCT-STATE SECTORS

States	Product	Small farms	Large farms	Small farm marginal product/large farm marginal product
Ceara	Cotton			
	% Q	33.3	66.7	
	% SFI	24.1	75.9	
	% Q/% SFI	1.382	.879	1.572
Pernambuco	Cotton			
	% Q	74.1	25.9	
	% SFI	81.2	18.8	
	% Q/% SFI	.913	1.378	.662
Pernambuco	Sugar (FGV)			
	% Q	6.7	93.3	
	% SFI	5.7	94.3	
	% Q/% SFI	1.175	.989	1.188
Pernambuco	Sugar (IAA)			
	% Q	10.6	89.4	
	% SFI	6.7	93.3	
	% Q/% SFI	1.582	.958	1.651
Alagoas	Sugar (IAA)			
	% Q	7.5	92.5	
	% SFI	6.5	93.5	
	% Q/% SFI	1.154	.989	1.167
Ceara	Cattle			
	% Q	36.8	63.2	
	% VF	34.7	65.3	
	% Q/% VF	1.061	.968	1.096

Source: Percentage shares from Cline, Economic Consequences of a Land Reform in Brazil, op. cit.

Notes: A. Variables: Q = production value. SFI = expenditure on seeds, fertilizers, insecticides. VF = expenditure on vaccines and animal feeds.

B. Ceiling "small farm" sizes: Ceara cotton, 30 ha; Pernambuco cotton, 30 ha; Pernambuco sugar FGV (Getulio Vargas Foundation data): 40 ha; Pernambuco sugar IAA (Institute of Alcohol and Sugar data): 100 ha; Alagoas sugar, 125 ha; Ceara cattle, 100 ha. In each sector all farms above these ceilings are classified in the large farm group.

C. Methodology: in the production function of the form $Q = AL^aN^bK^cS^d$ where Q is output, L land input, N labor, K capital, and S the input of seeds, fertilizer, and insecticides, marginal product of S equals d(Q/S). The ratio of this marginal product for small farms to that for large farms will therefore be $[d(Q/S)_o]/[d(Q/S)_1]$ where o is for small and 1 for large farms. If "%Q" is percent of total sector output and "%SFI" is percent of total sector seed-fertilizer-insecticides expenditure, then $(Q/S)_o$ equals $\{[(\%Q)Q_t]/[(\%S)S_t]\}_o$ and $(Q/S)_1$ equals $\{[(\%Q)Q_t]/[(\%S)S_t]\}_1$; where Q_t and S_t refer to sectoral totals. When the former is divided by the latter, the Q_t and S_t elements cancel. Therefore (and since the "d" in denominator and numerator of the first ratio in this note cancel), the ratio of marginal product of S on small farms to that on large farms is merely $[\%Q/\%S]_o/[\%Q/\%S]_1$, the value shown in the final column of the table.

small-farmer credit program might be excluded from such performance ratings. At the same time, loans could be guaranteed against default by a Central Bank fund, or protected with a subsidized crop insurance scheme. 1/ The subsidization of such a scheme might be one of the few ways of removing the organizational disincentives of the institutional credit system to lending to the small farmer. Providing crop insurance and diversifying loans with cattle are two ways of diminishing the institutions' aversion to lending to these farmers caused by climatic conditions. In addition, research efforts in drought-resistant varieties, combinations of crops, and planting and cultivation practices could result in less vulnerable agricultural production than provided by current practices, ultimately reducing the reluctance of banking institutions to lend to small farmers, as well as the farmers' aversion to acquire debt. Credit lines might be made available to specific cooperatives with demonstrated success, or to cooperative-forming ventures with high probability of success, particularly in cotton growing areas. A modification of legislation and banking practices that currently limit the operations of cooperatives should be considered.

185. Rural development programs could include a modified version of the PROTERRA land purchase credit program. As discussed above, the terms of the credit should be more in line with the financial ability of smallholders, and the beneficiary should be defined as the low-income producer who works the land without title, or who owns only a small plot. This land purchase credit could be combined with production credit and technical assistance. Such a program would tend to counteract the impact of labor and land legislation on large landholders, which has resulted in a worsening of the status of farmers without title to the land. Specific crops or regions might be selected, where it was known that landlord disposition to sell and sharecropper interest in buying was high, and where small-scale production had been demonstrated feasible and efficient.

186. The desirability of tying small-farmer credit to technical assistance packages involving purchase of inputs that increase productivity is implicit in the above suggestions. However, productivity-increasing packages involving substantial use of purchased inputs such as fertilizers, improved seeds and pesticides that make economic sense for the small farmers in the Northeast are virtually nonexistent. Except in the case of specific commercial crops, as discussed above, linking small-farmer credit directly to purchase of

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1/ In December 1973, the Government created a Guarantee Program for Agricultural Activities (PROAGRO) with the purpose of guaranteeing up to 80% of agricultural producer's financial obligations related to agricultural working capital or investment borrowing, against crop losses due to natural disasters, disease or pests. The actual implementation of this program, as well as its geographic coverage, has not yet been decided, but it is unlikely that, unless it is heavily subsidized by the Government, in its initial stages would operate in such a high risk zone as the Northeast, particularly since the main financial source contemplated in the law creating this program is only a 1% mark-up on the interest rate charged for the loans.

fertilizer, pesticides, seeds, etc., then, may not be possible, or may severely limit the scope of such programs. This is not to say that techniques, such as improved cultivation practices, for increasing productivity of small farmers are unknown or uneconomic; rather, their dissemination has been hampered by lack of a well planned delivery system and by general inavailability of institutional credit for small farmers.

187. Generally speaking, the purpose of agricultural credit is to allow increases in investment and output and there is strong presumption against financing consumption. However, in the case of small farms, the major input in the production process is the labor of the farmer. Financing this input necessarily iimplies financing the farmer's consumption to carry him from one harvest to the next. Most institutional credit available is tied to the purchase of "modern" inputs. While the input mix used by large farmers allows them to have access to credit while the input mix used by small farmers virtually precludes their utilizing institutional credit. The above analysis has shown that availability of credit, in and of itself, can make a significant contribution toward improving the economic well-being of small farmers. Such financing would reduce their dependency on intermediaries, giving them access to better market prices for inputs and their products. Such credit should be made available within the context of integrated rural development projects in which, through the introduction of some simple improvements in cultivation practices (rather than emphasizing use of additional inputs), significant increases in production could be attained as well. There is very little evidence that the Government's policy of subsidizing interest rates is economically justified. It is not clear that small farmers, or large farmers for that matter, need production subsidies in the form of negative real rates of interest to make their operations viable. Small farmers who have to resort to informal financial arrangements have been able to operate with positive interest rates, either explicit or implicit. On the other hand, interest rate subsidization tends to lead to misallocation of resources by stimulating the adoption of capital intensive techniques and contributes to asset concentration. A government subsidy to a crop insurance scheme might be a more desirable policy alternative than expanding the present scheme of interest - subsidized credit to smaller farmers. Crop insurance could reduce the risk to financial institutions of lending to small farmers and at the same time help overcome the farmers risk-averting behavior and increase their receptivity to new crops and new production techniques. In addition, the Government might consider payments to financial intermediaries to compensate them for the higher per unit costs involved in processing and administering small loans. These two initiatives could increase the flow of institutional credit to small farmers, thus reducing their dependence on non-institutional financial intermediaries and improving their access to the markets for their inputs and crops.

188. While there probably is a case for subsidization of the agricultural sector to offset the bias in favor of industry implicit in many government policies, from the resource allocation point of view, there may be more efficient ways to subsidized agriculture than through especially low interest rates. If the Government continues to feel that it must subsidize Northeast agriculture through low or negative real interest rates for agricultural credit, the least

it could do would be to make these subsidies available to small farmers as well. By restricting subsidized credit to the purchase of machinery, equipment or modern inputs which in most cases substitute for labor, current PROTERRA lines discriminate against the small farmer. A substantial line of small-farmer credit in the Northeast, with restrictions only on the size of the borrower's cultivated plot and his annual income, 1/ to prevent diversion of the funds to larger users, could have significant development implications. Most notably, it would increase the viability of small-scale agriculture and the competitiveness of small farmers. In addition, it would increase productive efficiency by removing the bias towards capital intensive agricultural technologies in the Northeast. It could even be argued that, if subsidies are to be given at all, they would be more justified in the case of small farmers since they would compensate for their higher vulnerability to climatic failure and consequent risk aversion. Finally, subsidizing small farmers could have the effect of reducing rural-urban migration. The cost of such a subsidy would have to be weighted against the alternative costs involved in increased urban infrastructure and social services needed to accomodate these migrants.

189. Despite the Bank of Brazil's limited involvement with small farmers, it would probably be the best institution to undertake such a program. Channeling a small-farmer credit program through the Bank of Brazil would take advantage of this institution's standing and power in the Northeast economy. The Bank of Brazil has substantial independence in its operations and could resist the opposition of leverage against large farmers to its activities benefiting smaller producers or sharecroppers. The Bank of Brazil could endorse a policy of financing long-cycle crops for those small farmers who were capable of producing and marketing them. And it could introduce a policy of disbursing its small-farm credit in strict adherence with the rhythms of the planting season rather than the rains much more easily than a smaller, less profitable financial institution.

190. The cotton cooperative experience shows that the Bank of Brazil was not unwilling, when in its self-interest, to align itself with the forces of change. The PROTERRA experience, in turn, indicates that the Bank of Brazil is particularly responsive when programs allow lending outside its normal credit ceilings. An extra credit ceiling for a small-farmer program, and a Central Bank interest subsidy in PROTERRA style, might be sufficient incentive for the Bank of Brazil to support a small-farmer credit program. Such a program should probably exclude the coastal branches of the Bank of Brazil since their urban location orient them to large farmer lending. The branches of the interior, in contrast, have good contacts with small farmers and such a program would be more appropriate for them than for those

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1/ There are some precedents in the banking system of credit being made available to farmers below a certain size. For example, the CRAN program financed small farmers defined as those with a value of production up to 100 times the minimum wage. A large-scale program designed to reach exclusively small farmers should probably have a lower ceiling since, according to data from the 1970 demographic census, 70% of Northeast rural families earn less than the minimum wage.

from the coast. Undoubtedly, there is a strong case to be made for placing a small-farmer program within an institution designed to assist small farmers. But given the absence of such an institution capable of serving the Northeast, and the lack of interest in creating one, the Bank of Brazil may be a good second best.

VI. INDUSTRIALIZATION, EMPLOYMENT AND NORTHEAST DEVELOPMENT

191. Aware of the serious economic and social differences between the Northeast and the more developed regions of the country, the Government has launched a number of programs aimed at increasing employment, diversifying the productive structure, and reducing the region's ecological and climatic disadvantages. The thrust of the Government's action during the 1960s was on heavy investment in infrastructure -- mainly transport and power -- and on industrialization, which was stimulated by generous tax exemptions, subsidies and investment incentives. While the massive inflow of federal funds derived from these programs contributed to rapid regional growth and may have prevented the economic gap from widening even more than it did, federal programs did not reach the large majority of northeasterners living at or close to subsistence level. Comparative regional advantages were neglected, and the industrialization program apparently was not able to generate sufficient employment opportunities to keep pace with the rapid growth of urban labor force.

A. The 34/18 Industrialization Program

Incentives to Industrialization

192. The main instrument for stimulating industrialization in the Northeast has been the channeling of substantial fiscal resources into an investment tax incentive scheme known as the Article 34/18 Program. The basic operational features of the 34/18 tax credit scheme have been analyzed in detail in recent Bank reports 1/ and will only be summarized here. The scheme was introduced in 1961 and permitted registered Brazilian corporations to reduce their annual federal income tax liability by 50% by opting to invest these tax savings in projects approved by SUDENE, the Northeast development agency. The system remained in force through the fiscal year 1970. The introduction of the National Integration Program (PIN) in 1970 preempted 30% of regional tax incentive funds and a further 20% was allocated to finance the PROTERRA in 1971. These two programs were recently extended through fiscal year 1978. As a result of these modifications, the tax savings available to corporations opting to invest in 34/18 projects has been reduced to 25% of their annual income tax liability. Firms may invest their tax credits in their own projects or choose third-party projects approved by SUDENE.

193. **Firms** sponsoring approved projects must combine their own equity (recursos proprios) with third-party 34/18 resources, which usually are incorporated in the form of nonvoting preferential shares. Projects are classified into five classes of priority to determine the participation of

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1/ IBRD: The Economic and Social Development of Brazil, Vol. IV, The Northeast Development Effort (March, 1973).

34/18 funds, which may comprise from 30% up to 75% of the total equity. Ranking in these categories is not determined by project evaluation but by reference to a point system which reflects SUDENE's development aims. Projects are first approved and then ranked. Normally, beneficiary firms with approved projects secure their entitlement of 34/18 funds through the BNB.

194. A second powerful investment incentive is provided by the BNB which may lend up to a maximum of 50% of total investment in approved projects. The principal inducement to invest in the Northeast, then, is the limited equity which the project sponsor must contribute because of the tax credit mechanism. For example, a firm with a project eligible to raise 75% of its total equity through 34/18 deposits, can reduce its own equity contribution from 25% to 12-1/2% by obtaining BNB financing. These 34/18 incentives are reinforced by a series of more conventional measures administered by the federal government, individual states and official development banks, including full or partial exemption from corporate income tax, tariffs, import charges and value-added tax (ICM) as well as provision of term and working capital financing. Individual state and municipal governments also compete to attract firms and offer a variety of inducements, notably the services of industrial parks. At the early stages of the program, strong incentives for the use of capital were probably necessary to provide the initial impetus for industrial investment. However, within this wide, complex and ingenious range of incentives for capital use there still is not one measure which operates directly to reduce the private opportunity cost of labor. The marked factor bias of this official incentive system contrasts rather sharply with the severe underemployment which characterize the Northeastern economy.

Recent Evolution of the 34/18 Scheme

195. Since the late 1960s, severe project financing difficulties have been encountered under the 34/18 scheme. The powerful tax credit mechanism has continued to stimulate a rising flow of requests for financing, and total approved investment in 1973 exceeded the 1970 level by 38% in real terms. However, as a result of the diversion of 50% of regional tax credit funds to the PIN and PROTERRA programs in 1970/71, 34/18 deposit flows in real terms have declined by 24%. The ratio of approved investment to annual deposit inflow has increased from two in the late 1960s to three in 1971/72 and reached four in 1973. The excess demand for 34/18 resources and the disorder this provoked in the 34/18 capital market led to the introduction in January 1974 of more rigorous federal regulations to control the commitment and disbursement of 34/18 funds. The sharp decline in the number of agricultural projects approved and their share in total investment, which fell from roughly 25% in 1971/72 to 7% in 1973, probably reflects the intense competition from industrial firms for 34/18 resources and the availability of new sources of agricultural term credit, notably PROTERRA.

196. The excess demand for tax credit resources has forced an increase in other forms of financing. The participation of 34/18 funds has declined from the 54% level attained in 1968 to roughly 31% in 1973/74. An increase

in the share of sponsors' own equity offset this decline in 1970/71 but term credit sources, particularly official development banks, have subsequently increased their participation sharply. In an effort to equilibrate the 34/18 capital market, SUDENE now actively encourages beneficiary firms to substitute term financing for 34/18 equity resources.

197. Estimated employment that would be directly generated by 34/18 industrial projects approved in the period 1960-73 would be 200,000 at full operation. If all these projects attained full capacity by 1976, this would represent 5% of the urban labor force in 1976 and 11% of the incremental growth over the entire 1960-76 period. This, in itself, would be insufficient to create a substantial impact on urban employment, since an estimated 20-25% of the urban labor force was underemployed in 1968-70. 1/ In addition, there are indications that the net employment effect of projects approved for 34/18 financing might be overestimated. First, these figures include some projects which have since been abandoned and have officially communicated this fact to SUDENE. 2/ Second, firms may overestimate their labor requirements to obtain a higher classification for 34/18 equity participation. Third, recent data fail to distinguish between employment in new and modernization projects. 3/ The direct employment effects of modernization investment may be decidedly negative. A recent study of the Textile Reequipment Program during the years 1961-70 showed a net loss of 6,700 jobs as a result of this program and it was estimated that it would reach 8,500 once modernization schemes are completed. 4/ Extraordinarily high indirect employment effects must, therefore, be assumed to sustain the view that the SUDENE 34/18 scheme is reducing the incidence of urban underemployment in the region. Nevertheless, it is reasonable to claim that the scheme has prevented a pronounced aggravation of this alarming situation. This represents in itself a significant contribution to resolution of the region's employment problems.

1/ See Georges Pellerin: "Oferta E Demanda De Mao-de-Obra Do Nordeste". (SUDENE, Recife, 1971); D.E. Goodman and R. Cavalcanti, "Industrialização Do Nordeste: Volume I - A Economia Regional (IPEA-INPES, Rio 1971); IBRD, Problems and Prospects in Employment and Incomes in Northeast Brazil (March 1973, Volume V).

2/ A recent study had to exclude 73 projects from the official total of 634 approved in the period 1962-69 in order to eliminate double counting and those projects which had been abandoned and had officially informed SUDENE to that effect. This task was undertaken by a joint IPEA/SUDENE team. See D. E. Goodman and R. Cavalcanti: Incentivos a Industrializacao e Desenvolvimento de Nordeste, (INPES-IPEA, Rio de Janeiro, 1974), Appendix.

3/ Employment attributed to modernization projects represented 31.4% of the 107,054 jobs associated with 34/18 projects approved in the period 1962-April 1970. Textile modernization projects contributed 16,295 jobs to this overall total.

4/ SUDENE-DI: Pesquisa Sobre a Industria Textil Do Nordeste, (Recife, 1971).

Table 41: THE 34/18 PROGRAM: TAX CREDIT DEPOSITS, PROJECTS, INVESTMENTS & DISBURSEMENTS, 1962-73

Year	Approved projects			34/18 Deposits/1	Total approved investment/1			34/18 Disbursements to approved projects/1		
	Industry	Agriculture	Total		Industry	Agriculture	Total	Industry	Agriculture	Total
1962	49	--		154.1	416.2	--	416.2	--	--	--
1963	59	--		118.5	560.0	--	560.0		--	1.5
1964	52	--		302.4	1,084.5	--	1,084.5		--	27.6
1965	59	1	60	774.1	719.7	12.9	732.6		--	41.5
1966	77	12	89	848.7	1,256.2	67.8	1,324.0	143.1	3.0	146.1
1967	152	52	204	1,026.6	3,216.1	287.4	3,503.5	437.5	21.6	459.1
1968	145	88	233	1,074.6	2,244.2	428.5	2,672.7	687.5	55.5	743.0
1969	121	90	211	1,325.3	2,224.2	519.5	2,743.7	851.3	92.8	944.1
1970	76	95	172	1,396.6	2,696.0	611.2	3,307.2	1,015.3	141.1	1,156.4
1971	63	106	169	1,049.5	2,735.7	812.1	3,547.8	1,046.3	153.7	1,200.0
1972	52	54	105	947.6	1,944.4	681.6	2,626.0	853.1	148.3	1,001.4
1973	56	33	89	1,121.0	4,266.1	304.9	4,571.0	604.9	151.9	756.8

/1 Expressed in Cr$ million at 1973 prices using the FGV Wholesale Price Index No. 2 (Disponibilidade Interna).

Source: SUDENE.

Table 42: 34/18 INDUSTRIAL PROJECTS: THE STRUCTURE OF FINANCING, 1962-74 (%)

Year	Own equity resources	34/18 equity participation	Bank financing	Total investment/1
1962	65.6	--	44.4	15.4
1963	36.8	20.1	43.1	36.4
1964	50.7	19.8	29.5	133.4
1965	49.1	23.8	27.1	138.9
1966	23.8	45.4	30.8	335.4
1967	21.9	44.8	33.3	1,099.9
1968	24.0	53.6	22.4	953.8
1969	26.0	50.9	23.1	1,141.0
1970	33.2	45.3	21.5	1,658.0
1971	38.7	44.9	16.4	2,027.1
1972	26.7	48.5	24.8	1,652.3
1973	26.0	32.5	41.5	4,266.1
1974/2	23.4	30.1	46.5	951.4

/1 Cr$ million at current prices.

/2 January-April 1974.

Source: SUDENE.

Investment Criteria and Project Evaluation Under the 34/18 System

198. The participation of 34/18 funds in total equity is determined by a point system which gives varying weight to selected project characteristics. The major criteria include plant location, type of product, use of regional inputs, labor absorption, import substitution and export promotion. Lesser weight is given to other characteristics such as labor participation in profits and the diffusion of equity ownership. This system is utilized solely to establish the participation of 34/18 resources in approved projects. Failure to satisfy one or more of these criteria does not mean that a project is ineligible for 34/18 resources. The points system is functionally divorced from the process of project evaluation. In essence, project evaluation amounts to screening out projects which do not represent profitable private investment opportunities. With profitability and managerial competence established, the amount of participation of 34/18 funds is determined by retrospective application of the points system. This procedure does not provide a project ranking based on either social or private opportunity costs as a guide to project selection.

199. The investment subsidy conferred by the 34/18 incentives imparts a general bias towards capital intensity both in choice of technique and choice of product. This general factor bias is accentuated by additional criteria utilized in the points system. For example, sectorial investment criteria discriminate heavily in favor of projects in the capital and intermediate goods industries which, in general, tend to be more capital intensive. This discrimination was reinforced before March 1969 by a second criterion which awarded additional points to projects substituting imports from outside the region. Given the traditional orientation of the region's industrial structure towards consumer goods and raw material processing activities, the capital and intermediate goods sectors offer greater scope for import substitution and, consequently, for increased capital deepening in industrial investment. The focus of this criterion has since been changed to give preference to projects undertaking import substitution at the national level. 1/

200. The rationale of these sectorial and product criteria is dubious. In a region of severe underemployment, these criteria further reduce the private opportunity cost of capital, thereby increasing the degree of discrimination against labor intensive sectors already present in the program. Furthermore, if special and additional subsidies are required to promote the capital and intermediate goods industries, there is an obvious danger of resource misallocation. The Northeast may have comparative advantage in individual subsectors of these industries, notably the relatively labor-intensive branches of metallurgy, machinery and electrical equipment. The main point is to adopt a selective approach based on considerations of dynamic comparative advantage rather than pursue indiscriminate import substitution at the regional level in an attempt

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1/ Exemptions from the state value added tax (ICM) retain the previous focus and are conferred on firms producing products without a similar in the state.

to duplicate the industrial structure of the Center-South. In terms of social opportunity costs, it would be more efficient for the region to continue importing capital and intermediate goods and encourage specialization in sectors which are competitive in extra regional markets.

201. The pronounced dependence of regional growth on continued resource transfers from the rest of the country would call for an investment allocation consistent with regional comparative advantage, so as to establish a dynamic export base. Despite this, SUDENE persistently has given low priority to promotion of exports to other regions of the country. At present, points are awarded under this heading only to firms selling 40% of their output in foreign markets. This restriction is difficult to justify on economic grounds and, accordingly, SUDENE should give much greater weight to export promotion to all extra regional markets. A selective investment policy based on dynamic comparative advantage should be complemented by more carefully elaborated industrial location policies. The points system has until now attempted to promote dispensed patterns of industrial locator inhibiting the efficient exploitation of agglomeration economies in Recife and Salvador.

Main Characteristics of 34/18 Investments 1/

202. The 34/18 scheme encouraged a shift in industrial output composition in favor of the intermediate and durable consumer goods as illustrated by the significantly greater participation of nonmetallic minerals and the four metal working and equipment industries in industrial value added between the early 1960s and the 1970s (Table 44). Although data limitations on capital and labor use rule out intra- and inter-regional comparisons with established industrial firms, it appears that subsectors with relatively high capital-output and capital-labor ratios have attracted a substantial proportion of 34/18 investment. The comparison of wage share estimates for 1966 and new 34/18 projects reveals that labor intensity has diminished in the majority of industrial subsectors, in some cases very sharply (Table 45). The capital intensity of the 34/18 scheme is also evidenced by comparison with manufacturing firms in Sao Paulo which shows that the average wage share in value added in Sao Paulo firms (27%) is significantly larger than in new 34/18 projects (17%). The estimates of factor shares drawn from all approved projects emphasize the capital deepening and unequal distribution of factor income associated with the 34/18 program.

1/ This is based on data drawn from 581 projects approved in the period 1962-April 1970. Although there is no reason to believe that these results are invalidated by the intervening period, neither SUDENE nor other federal agencies have assembled the primary data required to evaluate the current position. For further details, see D.E. Goodman and R. Cavalcanti: Incentivos a Industrializacao e Desenvolvimento do Nordeste (IPEA-INPES, Rio de Janeiro, 1974).

203. Estimates of the direct backward linkage effects of 34/18 projects approved in 1962-70 indicate that 50% of total 34/18 input requirements are imported from extra regional sources (Table 47). The limited dependence on regional sources is most pronounced in the case of manufactured intermediate goods with 60% of input requirements in this category being purchased abroad. These expenditure leakages arising from the limited direct complementarity between 34/18 firms and regional intermediate supply sources diminish the impact of the 34/18 program in terms of induced regional output and employment. The limited interdependence with regional sources is most striking in the linkage rich sectors of metallurgy, machinery, electrical and transport equipment and chemicals. These industries alone account for 55% of total extra regional purchases of manufactured inputs. The weak locational ties with Northeastern industry in the input side also emerges when 34/18 firms are classified by type of final product (Table 48). Dependence on locally produced inputs declines progressively across the spectrum from nondurable consumer goods to capital goods. SUDENE's policy of regional import substitution and industrial diversification has had the effect of encouraging those industries in which leakages into extra regional intermediate demand are most pronounced.

204. Although the promotion of industries dependent on the region's natural resource base formed one of the major guidelines originally established for Northeastern industrialization policy, 1/ the low share of primary products in input purchases is a further significant feature of the 34/18 scheme. Agricultural products, for example, represent only 6.2% of total direct intermediate purchases associated with 34/18 output (Table 49). The necessary qualification is that indirect interdependence between 34/18 firms and primary activities may be significant, although it is impossible to pursue this point with the data available.

Table 49: 34/18 PROJECT DATA: SECTOR OF ORIGIN OF INTERMEDIATE INPUTS

Sector of input origin	Composition (%)
Agriculture	6.2
Extractive industries	5.4
Mining	2.3
Manufacturing	52.0
Electric power	7.3
Fuel, oil, lubricants	7.3
Unspecified	19.5
Total purchases /1	1,991.2

/1 Cr$ million at 1969 prices.
Sources: IPEA/SUDENE

1/ See Grupo de Trabalho para o Desenvolvimento do Nordeste (GTDN): "Uma Politica de Desenvolvimento Economico para o Nordeste", Rio de Janeiro, 1959.

Table 43: SECTORAL DISTRIBUTION OF GROSS VALUE ADDED IN 1959, 1966 AND BY 34/18 PROJECTS APPROVED IN THE PERIOD 1962-70

(In percentages)

Sectors	1959	1966	Gross value added of approved 34/18 projects			
			Total (a)	New (b)	Modernization (c)	Share of (c) in total
Mining	11.8	4.8	2.8	1.2	8.5	62.8
Manufacturing: total	88.2	95.2	97.2	98.7	91.5	19.3
Nonmetallic minerals	7.2	7.2	12.6	10.4	20.9	34.1
Metallurgy	1.8	4.1	10.2	12.2	2.3	4.6
Machinery	0.1	0.7	2.7	3.4	-	-
Electrical equipment	0.2	1.0	6.4	7.5	2.3	7.2
Transport equipment	0.7	0.6	2.8	5.2	1.0	7.7
Wood products	1.5	1.0	1.9	2.4	-	-
Furniture	1.4	1.2	0.7	0.7	0.8	23.3
Paper, cardboard	1.5	0.7	4.7	5.3	2.3	10.3
Rubber	0.3	0.3	2.5	3.0	0.8	6.1
Leather products	2.0	1.0	1.4	1.1	2.5	37.2
Chemicals	13.2	16.0	16.4	19.4	5.0	6.2
Pharmaceuticals	0.3	0.3	0.8	0.8	0.7	18.2
Perfume, soap	1.3	1.3	0.8	0.9	0.4	10.3
Plastics	-	0.4	1.9	2.4	0.4	4.4
Textiles	21.2	19.9	14.3	8.9	34.9	50.3
Clothing, footwear	2.0	2.2	3.7	3.4	4.8	26.3
Food products	26.2	26.6	7.9	7.5	9.4	24.6
Beverages	2.6	4.3	3.2	3.6	1.5	9.5
Tobacco	2.7	3.6	0.3	0.1	1.0	73.7
Printing, publishing	1.7	2.4	0.7	0.7	0.5	15.2
Miscellaneous	0.3	0.4	1.3	1.8	-	-
Total	100.0	100.0	100.0	100.0	100.0	20.5

Source: 1959 Censo Industrial: "Producão Industrial de 1966," and (DEICON-IBGE); IPEA/SUDENE.

Table 44: WAGE SHARE IN VALUE ADDED (%)

Sector[1]	Northeast 1966	New 34/18 Projects	Sao Paulo 1969[1]
Mining	24	19	24
Manufacturing: Total	22	17	27
Nonmetallic minerals	23	19	25
Metallurgy	19	13	33
Machinery	25	26	32
Electrical equipment	23	20	29
Transport equipment	28	26	36
Wood products	31	14	28
Furniture	34	22	36
Paper, cardboard	30	15	25
Rubber	26	11	18
Leather products	23	13	34
Chemicals	25	13	21
Pharmaceuticals	20	43	20
Perfume, soap	13	6	13
Plastics	17	15	26
Textiles	22	13	28
Clothing, footwear	23	23	28
Food products	20	17	15
Beverages	25	23	19
Tobacco	20	29	11
Printing, publishing	36	21	39
Miscellaneous	27	24	27
Total	23	17	27

[1] Plants with 20 workers or over.

Source: 1966 and 1969: IBGE-DEICOM: Producao Industrial.
34/18 Projects: IPEA/SUDENE for the period 1962-April 1970.

Table 45: 34/18 PROJECT DATA: FACTOR SHARES IN VALUE ADDED, 1962-April 1970

	New projects	Modernization projects	All projects
Wages, salaries, social security	21.3	25.6	22.2
Directors' fees, commissions, bonuses	12.2	10.1	11.8
LABOR SHARE	33.5	35.7	34.0
Profit	48.5	46.7	48.0
Rent, royalties, interest payments	4.4	5.6	4.7
Depreciation	13.6	12.0	13.3
CAPITAL SHARE	66.5	64.3	66.0

Source: IPEA/SUDENE.

Table 46: 34/18 PROJECT DATA: REGIONAL ORIGIN OF INTERMEDIATE PURCHASES, 1962-70

Type of intermediate product	34/18 Intermediate demand/1	Region of origin (%)			
		North-east	Rest of Brazil	Imports	Non-specified
Agricultural products	123,351.8	100.0	--	--	--
Extractive products/2	107,887.1	88.3	7.2	4.5	--
Mining	44,806.5	66.2	2.6	31.2	--
Manufactures	1,033,672.3	40.2	46.7	10.5	2.6
Total/3	1,309,717.7	50.7	37.5	9.8	2.0

/1 Cr$ thousand at 1969 prices.

/2 Extractive products of animal and vegetable origin.

/3 Total intermediate demand is Cr$1,991,220.7 if expenditure on electric power, fuel oil, lubricants and unspecified materials are included.

Source: IPEA/SUDENE.

Table 47: 34/18 PROJECT DATA: ORIGIN OF INTERMEDIATE DEMAND FOR FINAL PRODUCT CATEGORIES, 1962-70

Regional origin of intermediate purchases	Product classification of 34/18 projects (%)			
	Nondurable consumer goods	Durable consumer goods	Intermediate goods	Capital goods
(A) Total inputs /1	474.3	191.2	564.2	79.9
Northeast	70.2	46.3	39.4	25.6
Rest of Brazil	26.8	50.9	37.0	73.2
Imports	2.2	2.8	19.6	1.2
Nonspecified	0.8	--	4.0	--
(B) Manufactured inputs /1	322.8	183.2	448.3	79.4
Northeast	56.5	45.0	29.1	25.4
Rest of Brazil	39.1	52.1	45.2	73.3
Imports	3.1	2.9	20.6	1.3
Nonspecified	1.3	--	5.1	--

/1 Cr$ million at 1969 prices. Purchases of power, fuel, oil, lubricants and nonspecified inputs are excluded.

Source: IPEA/SUDENE.

205. The fiscal incentives available under the 34/18 scheme were extended to the agricultural sector in 1965. SUDENE has approved 531 projects in this sector during the years 1965-73 involving total investment of Cr$3,725.9 million ($621 million) at 1973 prices (Table 42). This sum represents 15.9% of total approved investment under the 34/18 program in the period 1962-73. Agricultural projects appear to have had considerably greater difficulty in securing 34/18 deposits than manufacturing projects. Of the 517 projects approved between 1965 and June 1973, only 119 had entered production, and 61 projects had failed to secure 34/18 resources within the statutory period permitted by the fiscal incentive legislation and are no longer entitled to such funds. The advent of PROTERRA in 1972 has modified this situation by improving the access of agricultural projects to official term financing. The introduction in May 1974 of the Northeast Agro-Industry Development Program, which establishes a credit line of Cr$800 million for the period 1974-77, will accelerate the substitution of 34/18 equity funds by term financing.

206. The 531 projects approved between 1965 and 1973 were expected to create 22,427 new jobs in agriculture. This total represents 0.4% of the 1970 rural labor force and emphasizes the marginal contribution of these projects towards the solution of the region's rural employment problems. Furthermore, 34/18 agricultural projects are highly capital-intensive because of the heavy livestock component. The capital-labor ratio for agricultural projects approved has exceeded US$30,000 in 1972/73. This is significantly above recent estimates of capital-labor ratios for 34/18 projects in manufacturing industry. The contrast is more acute with the capital-labor ratio of US$6,435 estimated for proposed irrigation projects in the Northeast 1/ and what is probably the minimum settlement costs per family of approximately US$2,000 in public colonization schemes. 2/

Implications of 34/18 Project Financing for Northeast Development

207. The main development issues emerging from 34/18 project financing are the weakness of official financial intermediation, the growing disequilibrium between supply and demand for funds, and the limited incentives for labor absorption.

i. Financial Intermediation

208. From an operational standpoint in the past, the basic shortcoming of the 34/18 scheme has been the difficulty approved projects experience in obtaining their legal entitlement to tax credit resources. The continued domination

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1/ See W.R. Cline: Irrigation Projects in Brazil's Northeast: Base Studies in Social Cost-Benefit Analysis, (Unpublished report, IPEA-INPEA, Rio de Janeiro, 1971).

2/ Vania Porto Tavares et al: Colonizacao Dirigida no Brasil. (IPEA-INPES, Rio de Janeiro, 1972). There is some disagreement, however, about the long-term viability of low cost settlements. Also, there are diffierences of opinion about the type of costs which should or should not be inputed to the settlement projects (i.e., penetration roads). The Government is currently reevaluating its settlement policies in the light of the experience gained in the last few years.

of 34/18 financial intermediation by the private sector contributed to this problem. Beneficiary firms sponsoring projects retained full responsibility for securing their approved allocation of 34/18 funds and private investors with uncommitted tax credit deposits can choose freely among these projects. Private brokerage houses and commercial financial institutions performed intermediary functions in this market, with SUDENE and the BNB assuming purely administrative and supervisory roles.

209. With acute excess demand for 34/18 funds, beneficiary firms tried to avoid rapidly rising intermediation charges by negotiating directly with larger depositors. There has also been widespread resort to illegal practices to secure 34/18 funds and firms have supplemented the legal contractual terms offered to prospective investors. 1/ These terms usually comprised nonvoting preferential shares which were negotiable only five years after the project has entered full production. Examples of the abuses which have emerged in this market include the payment of cash "commissions" to depositors upon investment of their 34/18 funds and agreements to immediately repurchase the preferential stock issued to the investor.

210. These abuses led the Government, in December 1974, to create a new mechanism to centralize the application of 34/18 deposits. These will now accrue to a new regional investment fund, the Fundo de Investimentos do Nordeste, FINOR. Depositors of 34/18 funds will receive investment units in FINOR. Private intermediary functions will no longer be necessary and SUDENE and BNB will exercise full and direct responsibility for project financing. Neither the depositors nor the Fund will intervene in the management of firms receiving 34/18 deposits. The new system should equalize formal access to 34/18 funds and reduce discrimination against medium-size and small-size firms.

ii. Disequilibrium of Supply and Demand for Funds

211. Several modifications in SUDENE's regulations introduced over the past two years could relieve the imbalance between supply and demand for 34/18 funds. For example, eligibility for 34/18 financing is now restricted to projects involving fixed investment of more than 30,000 times the highest minimum salary, roughly Cr$11.3 million. Firms sponsoring previously approved projects which now fall below this new limit may obtain term credit under the BNB/SUDENE Small Industry Program. 2/ Additional measures to improve the flow of 34/18 resources

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1/ Brokerage fees have risen sharply in recent years and particularly since 1970/71 following the decision to preempt 50% of regional tax credit funds for the PIN and PROTERRA schemes. Brokerage charges to beneficiary firms ranged from 6 to 12% of the sum invested in 40%, depending on the reputation and bargaining power of the beneficiary firm.

2/ SUDENE **Portaria** No. 133-73 of March 15, 1973. These two decisions provide further, indirect confirmation of the difficulty encountered by small firms in securing 34/18 funds.

were introduced in January 1974, when SUDENE was required to present the Ministry of the Interior with an annual budget detailing the proposed allocation of 34/18 resources to approved projects, based on project implementation schedules and their requirements for 34/18 funds. A ceiling for annual commitments of 34/18 resources, determined by reference to the prospective availability and inflow of these funds is established, and disbursements to individual firms are related to their immediate project execution requirements. The purpose at the project level is to avoid the full, prior commitment of 34/18 deposits in early phases of project implementation. While this improves the allocation of the 34/18 funds for firms which have already secured prospective investors, it does not, however, improve the situation of SUDENE-approved firms looking for 34/18 funds, since the allocation of individual tax credits will still be a private investment decision. The introduction of the regional investment fund, FINOR, has transformed this situation by transferring the allocation of 34/18 funds to the federal authorities. At present, it appears that corporations and individuals opting to invest their tax savings under the 34/18 scheme will receive units or cuotas in FINOR. Procedures concerning the negotiability of these units have yet to be established.

212. Although it is too early to evaluate their efficacy, these measures provide impressive evidence of the concern to establish more orderly conditions in the 34/18 capital market. A further indication of this new approach is the recent agreement to limit 34/18 participation in PETROQUISA projects to a maximum of 20% of total investment. 1/ The maximum contribution to these projects will be Cr$120 million and 34/18 resources will be disbursed over four years.

213. The National Bank for Economic Development (BNDE) has been gaining increased importance in industrial term financing in the Northeast. Since 1970, BNDE has actively pursued a policy to raise the share of relatively backward areas in its total loan commitments. The Special Program of Financial Support to Basic Industry in the Northeast (PIB/NE) of the BNDE was introduced in December 1972 with the specific aim of offsetting the adverse effects caused by the chaotic state of 34/18 capital market. 2/ The PIB/NE furnishes the financing required for implementation before the firm has accumulated sufficient 34/18 funds for this purpose. This financing normally takes the form of a standby credit or bridging loan and it is amortized by authorizing the transfer to the BNDE of the 34/18 deposits subsequently committed to the project. However, if the firm fails to secure its entitlement of 34/18 funds, this bridging loan can be converted to a term commitment, with annual interest charges in the 5-8% range and ORTN monetary correction. 3/ The intention

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1/ PETROQUISA, a subsidiary of PETROBRAS, is engaged in the development of the Bahian petrochemical complex.

2/ BNDE: "1973 - Relatorio das Atividades."

3/ In the event of widespread resort to this option, special care will be needed to ensure that debt equity ratios do not reach excessive levels which threaten the viability of projects.

originally was to restrict PIB/NE operations to large-scale priority projects, particularly those utilizing local raw materials in such sectors as petrochemicals, mining and non-ferrous metals. While projects based on local raw materials will continue to receive priority, PIB/NE financing has now been extended to projects in all sectors, evidently in response to strong demand pressures. The importance of PIB/NE funds in 34/18 financing is likely to increase rapidly.

214. Two additional BNDE programs assist in relieving the excess demand for 34/18 resources by furnishing term financing. First, the Small- and Medium-Industries (SMI) Program finances small- and medium-size firms with fixed assets below 100,000 times the minimum salary. Secondly, the Industrial Modernization and Reorganization Fund (FMRI) created in 1971 offers financing for industrial mergers and takeovers, plant modernization and working capital. The BNDE, in close cooperation with SUDENE and BNB, is using this Fund to revitalize 34/18 projects which are only partially implemented or have encountered technical and financial difficulties since completion. These various financing channels should give the BNDE significant influence in project selection and general industrialization strategy in the Northeast. 1/ This influence can be exercised to achieve greater selectivity in investment allocation, replacing the previous autarkic approach to industrial development with its emphasis on indiscriminate import substitution and regional autonomy. BNDE participation may thus provide an institutional framework in which to reconcile regional and national industrial policy objectives.

iii. Industrialization and Labor Absorption

215. The impact on employment growth and income distribution of the attendant shift in industrial output promoted by the 34/18 scheme deserves emphasis. Capital-labor ratios of new 34/18 projects in the intermediate goods industries are twice those in the consumer goods sectors and the share of wages in value added is 25% lower. 2/ This pattern of industrial development clearly does not contribute to improve the currently unsatisfactory distribution of income in the Northeast. 3/ Two sets of measures could significantly stimulate labor absorption and thus improve income distribution effects of 34/18 financed projects. First, the blanket discrimination in favor of capital and intermediate goods industries should be eliminated from the points system. This change would remove the additional, special subsidy conferred on these industries by the points system. Progress toward greater equalization of the capital subsidy between sectors should promote a more efficient allocation of 34/18 resources. Insofar as higher capital-output ratios characterize these industries, they already obtain differential benefits

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1/ In 1973, 34/18 financing conceded by SUDENE was only slightly greater than total BNDE industrial loan commitments in the Northeast.

2/ Estimates obtained from new projects approved in the period 1962 - April 1970. The product categories are based on data for final output rather than the industrial classification of firms.

3/ See C.G. Langoni: Distribuicao da Renda e Desenvolvimento Economico do Brasil (Expressao e Cultura, Rio, 1973), Chapter 7.

from the general capital subsidy. This proposal would modify the industry mix of 34/18 investment in favor of consumer goods sectors and so accelerate employment creation as well as the absorption of local raw materials. This compositional effect could be reinforced even further by lower levels of interest rate subsidies in industrial financing. The presently higher share of project financing coming from bank loans will work in this direction insofar as term credit is less highly subsidized than 34/18 equity resources.

216. The second set of measures comprises those which deliberately favor labor-intensive techniques and products by subsidizing labor costs. One possibility would be paying some proportion of the social security charges presently paid by employers. Such charges represent 40-45% of direct wage costs in manufacturing industry, as given by the official minimum salary. This program could be financed by establishing a special fund with resources provided by a compulsory levy on 34/18 depositors and federal budgetary allocations. 1/ A special labor subsidy fund also could undertake the payment of manpower training and qualification costs imposed on firms via their compulsory contributions to the SENAI/SESI schemes. 2/ The financing of intensive courses of formal education and vocational training for industrial workers offers further possibilities for subsidizing labor costs. Finally, means of structuring the system of corporate income tax exemptions in order to reduce private labor costs could be devised.

Concluding Remarks

217. The past emphasis on industrial autonomy via indiscriminate regional import substitution is likely to be gradually superseded by investment allocation more consonant with the region's factor endowment. The BNDE is actively promoting this orientation in implementing its PIB/NE scheme. This approach also is being nurtured by closer cooperation between regional and national development agencies in project financing and program execution. These working relationships, if sustained, could provide an institutional framework for the formulation and coordination of consistent regional and national industrial policies. The neglect of employment objectives and income redistribution in a region of pronounced underemployment and income inequality follows directly from this failure to base investment allocation on social opportunity costs. The bias against investment in labor-intensive techniques and sectors could be modified by basing project approval on social opportunity cost criteria, and/or by the introduction of a special program to directly and indirectly subsidize labor costs in order to stimulate labor absorption. Such measures would benefit the region's traditional sectors and would, therefore, also strengthen backward linkages with the local raw material and agricultural base.

1/ Projected annual social security payments by all new firms approved by SUDENE in 1962 - April 1970 were 15% of the inflow of 34/18 deposits in 1970. See D. E. Goodman and R. Calvalcanti, op. cit., Chapter 13.

2/ National Industrial Apprenticeship Service.

B. Small- and Medium-Size Industry Financing Programs

The Role of Small- and Medium-Size Industrial Firms

218. Financing programs to give special support to small- and medium-size firms have been recommended for Brazil in general and the Northeast in particular on the general grounds that the expansion of these enterprises would tend to:

(a) encourage the formation of entrepreneurial ability;

(b) promote the spatial dispersion of manufacturing industry and so diminish regional inequality;

(c) result in the wider utilization of relatively labor-intensive techniques; and

(d) promote a more competitive industrial structure and attenuate trends towards the concentration of industrial activity in large enterprises.

However, none of the agencies involved in industrial financing in the Northeast were able to assign a precise role to these firms within the context of regional development strategy and current industrialization programs. For example, there is no region-wide program to identify and promote industries in which small- and medium-size firms have competitive advantages and afford good opportunities for increasing labor absorption. Again, development agencies do not provide special orientation nor undertake promotional activities specifically designed to encourage local small- and medium-size firms to adapt to the input mix and productive structure of 34/18 enterprises.

219. Despite this, there are several indications that there is excess demand for term financing by small- and medium-sized firms in the Northeast. The difficulties encountered by approved SUDENE projects in securing their entitlement to 34/18 equity resources are particularly acute for such firms, as they are generally unknown to holders of 34/18 tax credits. Furthermore, larger 34/18 firms now are being actively encouraged by SUDENE to seek term financing from the BNB, BNDE and other official sources. These pressures on domestic sources of long-term industrial finance are likely to be exacerbated by a general tightening in the availability of foreign financial credits. In addition, official term credit institutions discriminate against smaller firms.

Institutional Framework of Small- and Medium-Industry Programs

i. The BNDE Scheme

220. The BNDE Small- and Medium-Size Industry (SMI) Program furnishes term credit for fixed investment by new firms or those undergoing modernization and expansion whose fixed assets (present value) do not exceed 100,000

times the highest official minimum salary in Brazil (approximately US$37.7 million in 1970) upon completion of the project. Financing is conceded for a maximum of eight years, including grace of two years, although the average loan term in practice is four years. BNDE financing is restricted to 60% of projected total investment but the BNDE's financial agents can finance a further 20% from their own resources. Funds are available to the final borrower at an annual interest rate of 4 to 7% plus ORTN monetary correction, depending on the region in which the borrower is located and ranging from 4% in the North, Northeast, West and Espirito Santo to 7% in Sao Paulo.

221. FIPEME financing is secured by the surety of the firm's directors and real assets. Additional collateral requirements may extend to the directors' personal assets. The value of the real assets demanded as collateral ranges from a minimum of 1.4 to some 1.7 times the value of the financing requested. These severe and rigid security requirements of the BNDE program mean that firms' real assets in many cases are completely tied up, effectively eliminating the possibility of additional borrowing from other sources. Moreover, the onus of these collateral requirements is increased by the general tendency on the part of the lenders to underestimate the value of firms' real assets and the failure to allow for their appreciation during the term of the loan. Due to these practices, the actual ratio between the real asset value needed as collateral to secure BNDE financing and the amount of the loan is probably closer to 2.5 or 3. The BNDE now channels virtually all FIPEME funds through credit lines with its accredited financial agents, which include state development banks and regional development banks throughout Brazil. The BNDE charges an interest rate of 2 to 5% plus monetary correction on these funds and the intermediaries are allowed a further 2% spread. The BNDE regularly evaluates the loan portfolios and general performance of its financial agents in order to raise operating standards.

222. The SMI credit line is only one element in the BNDE's general strategy to create a national development banking system and establish the state development banks as major term lending institutions. An increasing proportion of the loan commitments of several major BNDE programs accordingly has been channelled through the state development banks in recent years. BNDE credit lines form the state development banks' principal source of resources, accounting for 50-80% of their total loan commitments.

Table 49: REGIONAL DISTRIBUTION OF PLANTS, EMPLOYMENT AND VALUE ADDED IN BRAZIL, 1969

Region / Plant Size	0 - 99 Workers			100 - 499 Workers			500 Workers or more		
	Plants	Employment	Value added	Plants	Employment	Value added	Plants	Employment	Value added
North	2.7	1.9	1.3	1.5	1.4	1.0	0.9	0.6	0.2
Northeast	22.4	12.3	8.3	9.6	10.3	6.7	9.2	6.4	3.8
Southeast	48.7	59.2	65.1	72.4	73.1	80.3	79.6	84.5	90.0
South	21.4	23.9	23.0	16.0	14.8	11.6	10.0	8.2	5.9
Central-West	4.8	2.7	2.3	0.5	0.5	0.4	0.3	0.3	0.1

Source: F. Robalinho and R. Modenesi: "Pequenas e Medias Industrias (IPEA-INPES, Research Report No. 17, Rio, 1973). Primary data from IBGE-DEICOM: "Producao Industrial, 1969."

Table 50: SIZE DISTRIBUTION OF MANUFACTURING PLANTS IN NORTHEAST BRAZIL, 1969

Plant size by number of workers	Number of plants	% Distribution[1] Employment	Value added
0 - 4	3,085	3.8	2.0
5 - 9	2,169	7.2	4.0
10 - 19	1,274	8.7	6.6
20 - 49	706	11.2	11.5
50 - 99	246	8.6	8.6
100 - 249	99	16.5	18.0
250 - 499	107	18.9	19.9
500 - 999	51	17.1	16.4
1,000 or more	11	8.0	13.0
Totals	7,748		

[1] The distribution refers to a total employment of 193,831 workers and a total value added of Cr$2,078.7 million.

Source: IBGE-DEICOM: "Producao Industrial, 1969."

223. As in other regions, BNDE operations in the Northeast are intended to strengthen the capacity of the local state development banks network. 1/ However, the SMI Program in the Northeast also is regarded as a vehicle for raising the region's participation in total BNDE financing. The past concentration of BNDE operations in the Center-South has long been a sensitive political issue and the BNDE is now seeking a more equal regional distribution of its financing to allay such criticism. The SMI Program is an important instrument of this regional diversification strategy and the Northeast's share of loan commitments under this scheme has risen very sharply from less than 5% before 1970 to 22% in 1973. The role of the SMI Program in this diversification policy is likely to become more significant in the later 1970s.

224. Recent data on the SMI Program throughout Brazil for the period January 1972 - July 1973 emphasizes the marked concentration of loan financing in enterprises with substantial numbers of employees. Firms with 100 workers or more accounted for 85% of the loan value (Table 54). The data also indicate that SMI funds are being used to finance fairly labor-intensive industries. The national average level of fixed assets per worker before financing was Cr$24,400. Loan recipients in the Northeast, however, are much more capital-intensive than the borrowers in the rich South-Central region. The average fixed assets/worker ratio of borrowing firms in the Northeast was Cr$35,800 almost 50% above the national average and twice that for the Center-South (Table 55). An analysis of the size of sub-borrowers during the same period, by fixed assets, indicates that about 84% of all loans and 50% of total loan value went to firms with less than Cr$5 million in fixed assets (Table 56). Actual lending has, then been concentrated in relatively smaller-size of firms eligible under the Program.

ii. The BNB/SUDENE Scheme

225. The distinctive feature of the BNB/SUDENE scheme, initiated in 1967, is the attempt to establish an integrated program of technical and financial assistance for small- and medium-size firms. The scheme is jointly coordinated by these two agencies with the BNB furnishing financial resources. SUDENE is responsible for project evaluation and administers the technical assistance program, which is conducted through the regional system of Industrial Assistance Centers (NAI). Eligibility for the BNB Program is restricted to firms with fixed assets which do not exceed 30,000 times the highest official minimum salary in Brazil (approximately Cr$11.3 million in 1974). Financing is available to the final borrower for a maximum of eight years, including grace of two years. Loans can be used for fixed investment and/or working capital; financing exclusively for the latter purpose is granted for a maximum period of four years. The BNBs participation in projected total investment is limited to 80% although its financial agents -- the state development banks -- may finance a

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1/ The state government is the principal shareholder in state development banks, usually holding over 90% of the equity. The presidency and directorships of these banks are political appointments within the gift of state governors.

further 10% from their own resources. The upper limit for BNB financing was raised in 1972 from 4,000 to 15,000 times the highest official minimum salary. The nominal interest rate is 16% to the final borrower, without monetary correction. 1/ (The spread to the intermediary is 3%.) This gives a highly subsidized interest rate due to the use of prefixed monetary correction rather than the ORTN index.

226. Since March 1973, the BNB has adopted a system of credit lines similar to that used under the BNDE/SMI scheme. The state development banks now are required to submit annual loan programs, disaggregated by industry, for SUDENE approval and the size of the credit line then is determined in conjunction with the BNB. This streamlining gives the state development banks more independence in decision-making and represents a marked improvement over the previous system, which required SUDENE approval for individual loan contracts exceeding 1,500 times the highest minimum salary. Also, financial agents previously only received BNB resources in accordance with the disbursement schedule approved for each subloan contract. These changes in the BNB scheme in part are a response to the greater competition from the BNDE/SMI program and the slow commitment rate of BNB resources experienced in 1970-71. In addition, it appears that the decision to increase the total assets eligibility limit, the individual loan ceiling and the maximum period of financing 2/was prompted by doubts concerning the BNB's capacity to commit the US$20 million equivalent made available under the BNB/USAID agreem1973.

227. Loan security requirements for the BNB program are also severe and again include personal guarantees from firms' directors and real assets, normally a first mortgage on firms' property. The effect is to tie up firms' real assets for the duration of the loan. It seems, however, that this requirement has not deterred the participation of small- and medium-firms, since as of December 1974, about 95% of the resources made available under the BNB/USAID agreement had been committed. The average size of loans under the BNB program was considerably smaller than in BNDE/SMI indicating a greater orientation towards smaller firms. However, the average loan size has increased significantly in recent years. Neither SUDENE nor the BNB were able to furnish loan data for firms classified by assets or number of employees. However, over 80% of the loans were below 500 times the highest minimum salary which is consistent with the view that the BNB program has concentrated its activities on the region's smaller firms, at least in terms of the number of loan operations. Average total assets per borrower was Cr$310.2 thousand before financing (at 1973 prices). This would place BNB loan recipients at the lower end of the size spectrum under the BNDE/SMI scheme.

1/ Until March 1973, the nominal rate was 20%, without ORTN monetary correction.

2/ Before March 1973, the total assets criterion for eligibility was set at 10,000 times the highest minimum salary, the individual loan limit at 4,000 times this salary and the maximum loan term was four years.

Table 51: REGIONAL DISTRIBUTION OF TOTAL BNDE FINANCING 1969-73/1

Regions	1969	1970	1971	1972	1973
North	2.5	1.1	0.8	0.7	1.7
Northeast	16.6	12.4	9.5	12.8	19.6
Southeast	57.9	64.2	65.4	54.2	54.7
South	11.4	17.3	19.9	20.4	17.0
Central-West	4.6	1.4	1.2	6.4	2.2
Inter-Regional	7.0	3.6	3.2	5.5	4.8
Total/2	1,349	1,865	3,218	4,870	7,508

/1 Includes FINAME operations.

/2 Cr$ million.

Table 52: NORTHEAST PARTICIPATION IN MAJOR BNDE LOAN PROGRAMS IN 1973

Loan Programs	Northeast		Total Brazil
	Cr$ thousand	% Share	Cr$ thousand
FRE	1,007,130	26.3	3,831,306
FIPEME	137,847	22.0	627,447
FINAME	259,503	13.2	1,970,431
All Programs	1,473,317	19.6	7,508,078

Source: BNDE: 1973 Relatorio das Atividades.

Table 53: LENDING DISTRIBUTION BY FIRM SIZE OF BNDE/SMI FINANCING, JAN. 1970-JULY 1972

Firm size by number of workers	Number of loans	% of total loans	Average loan size (Cr$ thousand)	% of total loan value	Assets per worker before loan (Cr$ thousand)	Average fixed assets per worker after loan (Cr$ thousand)
Less than 19	6	1.6	198.7	0.2	76.9	58.1
19 to 49	42	11.1	803.7	5.1	28.4	38.2
49 to 99	72	18.9	818.2	8.9	20.3	21.8
99 to 249	132	34.7	1,519.2	30.3	23.5	23.2
249 to 499	70	18.4	2,175.5	23.0	33.5	16.3
Over 499	58	15.3	3,714.7	32.5	12.1	11.6
Average Total					24.4	22.1

Source: BNDE.

Table 54: GEOGRAPHICAL DISTRIBUTION OF BNDE/SMI LOANS
1972-73

Regions	% of number of loans	Average loan size (Cr$ million)	Average fixed assets per worker of firms financed (Cr$ thousand)
Northeast	9.7	1,813	35.8
South-Central	28.4	2,042	18.3
South	50.1	1,232	24.4
Other regions	11.8	2,070	35.1

Source: BNDE.

228. Available estimates indicate that BNB financing has been allocated to highly labor-intensive firms. The average investment cost per new job of Cr$35,622 at 1972 prices (approximately US$5,940) compares extremely favorably with the average of US$16,000 estimated for projects approved under the 34/18 fiscal incentive scheme in the years 1967-70. 1/

iii. The NAI (Industrial Assistance Centers) System

229. SUDENE has been instrumental in establishing the regional system of NAIs and provides financial resources, technical orientation and training courses for their personnel. The NAIs are found in each of the ten states in the SUDENE administrative area and their activities include:

(a) direct technical assistance and advisory services for small- and medium-size firms;

(b) the preparation of investment projects and the associated documentation required to apply for loan financing and to participate in state and federal fiscal incentive programs;

(c) training courses for management personnel; and

(d) sectoral studies and research to identify investment opportunities.

230. The NAIs work in close association with the state development banks and other state government development agencies. However, financing under the BNB program is not dependent on the borrower's agreement to accept technical assistance from the NAI and the degree of coordination between state development banks and NAIs varies from state to state. Nevertheless, for specific loan applicatons, the state development bank base its final decision on the results of a technical and financial evaluation of the firm in question undertaken at its request by the state NAI. Following this appraisal, the state development bank may stipulate that the firm receive technical assistance from the NAI as a condition of the loan.

231. The BNDE has contributed towards the financing of the regional system of NAIs since 1970, although SUDENE still retains responsibility for the coordination and supervision of their activities. This arrangement has been confirmed by a recent agreement between SUDENE and the Brazilian Center for Management Assistance to Small and Medium Enterprises (CEBRAE). The latter was created in 1972 by the BNDE to coordinate its activities in the field of management training and technical assistance to small- and medium-size firms. CEBRAE presently finances an estimated 60% of the operating expenses of the NAIs in the Northeast. The BNDE staff is hopeful that the planned expansion of CEBRAE activities will promote closer cooperation between the state development banks and the NAIs in the administration of programs for small- and medium-size industry.

1/ See IBRD: "The Northeast Development Effort" (November 1972).

Table 55: BNB/SUDENE PROGRAM: SMALL- AND MEDIUM-INDUSTRY FINANCING

(Cr$ thousand at July 1973 prices)

Year	Number of loans	BNB resources	Financial agents' resources	Total financing	Average size of loan	Total assets per firm before financing/1
1967/2	31	5,343	756	6,099	196.7	285.0
1968	261	44,018	6,508	50,526	193.5	236.4
1969	139	29,736	4,651	34,387	247.3	285.1
1970	28	6,533	1,411	7,944	283.7	292.0
1971	47	10,201	1,532	11,733	249.6	413.9
1972	60	16,159	2,661	18,820	313.6	519.7
1973/3	30	10,093	1,867	11,960	398.6	530.1/4
Total	596	122,083	19,386	141,469	237.3	310.2

/1 Fixed assets and working capital.

/2 September-December only.

/3 January-July inclusive.

/4 Full year estimates is Cr$684.0 thousand.

Source: BNB-CARIN: Small-Industry Division.

232. It is extremely difficult to evaluate activity levels under technical assistance programs, particularly when these are measured by aggregating consultancy contacts of varying duration and importance. Frequently, there is a strong tendency to list and number the performance of very minor services in order to achieve higher administrative ratings or "scores". Despite these caveats, however, the regional system of NAIs has increased its activities significantly in the period 1968-72 (Table 58). This in part reflects the formation of new centers and increased staffing associated with the consolidation of the system. However, the accumulation of experience by the NAIs, staff training programs and the recruitment of specialized professionals also have played a decisive role in this expansion. 1/

Competition Between the BNB and FIPEME Programs

233. The characteristics of the BNB small-industry program will change radically as a result of revised regulations introduced in March 1973. 2/ The main alterations in operating norms may be summarized as follows:

(a) the size of firm eligible to participate in the program has been trebled, rising from 10,000 to 30,000 times the highest minimum salary. The new criterion refers to fixed assets, not total assets as under the previous regulations.

(b) the individual loan ceiling has been increased from 4,000 to 15,000 times the highest minimum salary.

(c) the maximum loan term has been doubled, rising from five to ten years for the BNB's financial agents and four to eight years for final borrowers.

(d) credit lines comprising sufficient resources to implement the state development banks' annual loan programs have replaced the previous system of individual project approval.

234. These revised regulations mark a decisive step towards financing relatively larger firms. The tendency for the average loan BNB size to rise and the distribution of loan financing to shift towards larger firm size classes is reinforced by two recent decisions. SUDENE has increased the lower limit for access to the 34/18 fiscal incentives from 10,000 to 30,000

1/ For an evaluation of the NAI system, see F. Robalinho and R. Modenesi: Pequenas e Medias Industrias (IPEA, Rio de Janeiro, 1973), Chapter 4. Also Marlos Jacob de Melo: As Pequenas Empresas no Desenvolvimento Industrial do Nordeste (Recife, July 1971).

2/ Portaria SUDENE/BNB 001/73.

Table 56: BNB/SUDENE SMALL- AND MEDIUM-INDUSTRY PROGRAM: INVESTMENT AND EMPLOYMENT FOR THE PERIOD SEPTEMBER 1967-MARCH 1974

(Cr$ thousand at 1973 prices)

Total assets before loan	Projected investment/1	Total assets after loan	Employment			Average Total assets per worker		Net investment/ net employment
			Before loan	After loan	New jobs	Before loan	After loan	
217,571	239,061	456,632	14.133	20,844	6,811	15,504	21,907	35,622

/1 BNB and financial agents' financing plus firms' own resources contribution.

Source: BNB-CARIN: Small-Industry Division.

Table 57: ACTIVITIES OF INDUSTRIAL ASSISTANCE CENTERS (NAIs) IN THE NORTHEAST, 1968-72

Year	Direct technical assistance services to individual firms	Number of loan applications prepared	Number of applications for fiscal incentives prepared	Other activities
1968	22	69	--	2
1969	83	112	10	6
1970	106	70	36	10
1971	120	89	45	67
1972/1	133	105	37	70
Total	464	445	128	155

/1 Until October.

Source: BNB-CARIN: Small-Industry Division.

times the highest minimum salary, or approximately Cr$11.3 million in 1974 1/. Firms with fixed assets in the Cr$3.7 to Cr$11.3 million size category, now no longer eligible for 34/18 financing, can be accommodated under the revised Bank of Northeast Brazil regulations. Secondly, these new regulations grant eligibility to firms with already approved 34/18 projects whose fixed assets are below Cr$11.3 million. Both these decisions are likely to generate a significant increase in the demand for BNB financing by larger size firms.

235. This recent reorientation places the BNB program in more direct competition with the BNDE/SMI scheme, although the BNB ceiling for eligibility is still well below the BNDE/SMI maximum of Cr$38 million in fixed assets. Nevertheless, there is little doubt that the revised regulations were introduced in order to retain the adhesion of the state development banks to the BNB program and achieve higher levels of loan commitment. BNB terms to intermediaries now are relatively more attractive as the spread on its credit lines exceed those of the BNDE/SMI scheme. Final borrowers also incur lower financial charges under the BNB program due to the use of prefixed monetary correction rather than the ORTN index.

236. For smaller firms to have continued access to official sources of term credit, it is essential that the BNB and FIPEME program be governed by developmental considerations rather than calculations of financial advantage. This commercial orientation of state development banks was at the root of the difficulties experienced by the BNB program in 1970/71 when the state development banks were extremely reluctant to undertake small-scale loans on the grounds that the spread did not cover the administrative costs incurred in such operations. The state development banks did not accept the argument that such costs should be subsidized by gains made on larger-scale operations. In addition, the balance of financial advantage for the state development banks at that time resided in the expansion of the BNDE/SMI system. This probably is still the case despite the revised BNB regulations due to the greater relative importance of the BNDE/SMI credit line as a source of state development banks resources.

237. The preeminence of commercial banking attitudes over a more developmental orientation continues to characterize state development banks activites and forms a central obstacle to the creation of a successful financing program for small industries. For this reason, the elimination of the overlap between borrower categories under the BNB and BNDE/SMI programs will not remove the discrimination against small firms in these official term credit markets. In the absence of a fundamental change in approach and attitudes, the state development banks are unlikely to be active in promoting small industry loans under either program unless offered financial inducements which fully compensate for the higher risks and administrative costs involved.

1/ SUDENE Portario No. 133/73 of 25 March 1973. The limit is defined in terms of fixed assets value.

Improving the Development Orientation of Small- and Medium-Industry Programs

i. Relaxation of Collateral Requirements

238. Relaxation of strict loan security requirements of the BNDE and the BNB would impart a more pronounced development orientation to small- and medium-industry programs. In turn, the state development banks should be given both encouragement and inducement to adopt a more promotional orientation in implementing the BNDE/SMI and BNB programs. Discrimination against smaller firms would be attenuated by reducing the required ratio of real assets to loan value from the present 1.6 average level to unity or below. A related but more indirect approach is offered by SUDENE's recent proposal to form a "Collateral Fund" which would furnish acceptable loan security in order to bridge the gap between the real assets available to the firm and official collateral requirements. Several loan guarantee schemes have been under discussion recently in Brazil, notably the so-called "Projecto Aval" 1/ and the BNDE and the BNB probably should jointly evaluate the alternative small business loan guarantee proposals with a view to immediate implementation in the Northeast.

239. The benefits of a loan guarantee scheme for small firms are more likely to be realized if it is closely linked to an active technical assistance programs. Such a program would identify the specific problems of individual firms and use this diagnosis to assess their capacity for financing. In addition, this assistance should extend to the formulation of investment projects and loan applications. Private consultants' fees for these services, are onerous, involving a fixed charge plus a percentage of total project investment. The regional system of NAIs already furnish these technical assistance services, including subsidized project preparation 2/. However, the scale of NAI activities would have to be expanded considerably if a small-industry loan guarantee scheme is to have wide impact.

240. CEBRAE may be the appropriate agency to coordinate a loan guarantee scheme and an expanded technical assistance program in the Northeast, since some degree of centralized administration will certainly be needed. Its financial support of the NAIs already has been noted but this constitutes its only real activity at present. The future role of CEBRAE is difficult to discern although it is seen by some Brazilian officials as an embryonic Small Business Administration modeled on the United States pattern.

1/ See "Projeto Aval," a report prepared in 1973 for the Confederacao Nacional de Industria by F.J. Robalinho. This report proposes the creation of institutional machinery which will insure or guarantee lenders, on a pro rata basis, against default risk by small- and medium-size borrowers. The aim is to reduce the constraints imposed by existing collateral and guarantee requirements on the access of such borrowers to official term financing.

2/ The NAI in Pernambuco charges the direct cost of these services. The NAI in Ceara demands 1% of the financing being requested.

ii. Strengthening of State Development Banks

241. Removing the institutional sources of discrimination against small firms can be achieved only if the state development banks are prepared to process small-industry loan applications, and actively seek higher levels of loan commitment in this borrower category. Under present arrangements, the state development banks have no inducement to undertake promotional activities to expand small-business loan portfolios because the spread to the intermediary does not cover the direct costs of project appraisal and promotion. A number of factors can be identified which combine to limit the developmental activities of the state development banks.

242. Project Appraisal Capacity. The limited number of well-qualified personnel with experience in project evaluation is a major constraint on the adoption of more active promotionally-oriented loan programs by the state development banks. Almost invariably, their project evaluation departments are understaffed and their personnel are overworked and underpaid. Administrative pressures to achieve loan commitments combined with understaffing militate strongly against promotional activities. The result is that state development banks' loan programs remain oriented towards traditional business customers. All state development banks suffer from high rates of staff turnover. Salaries on entries are sufficient to permit recruitment of good quality graduates but subsequent incremental steps on state development banks salary scales are too low to remain competitive with private sector employment once staff members gain experience. A more developmental orientation is unlikely unless the state development banks can retain able professionals and expand their project appraisal capacity. This objective will require a revision of salary scales and the establishment of a well-defined career structure for executive and professional staff will be necessary.

243. Commercial and Developmental Conflicts. The "mixed" state development banks i.e., those that combine commercial and development banking functions, 1/ are legally required to devote 70% of their loan resources to their Industrial Development Portfolio and only 30% to short-term commercial credit. It is clear, however, that some term credit lines are diverted to short-term commercial loans, although it is extremely difficult to assess their quantitative importance in total loan operations. One great incentive for this practice arises from the fact that the commissions and fees paid to directors of the "mixed" state development banks are related to the profitability of their operations. This practice could be eliminated by BNDE acquiring an equity participation in the state development banks and appoint one or more

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1/ The state development bank network in the Northeast includes state government banks which perform both commercial and development banking functions ("mixed" state development banks) and those that have no commercial banking interests ("pure" state development banks). The states of Maranhao, Rio Grande do Norte and Bahia have "pure" state development banks, and the "mixed" state development banks are found in the remaining five states.

directors to supervise the use of its credit line resources. A more radical alternative would involve the creation of separate state development banks in those states which presently have the "mixed" type of institution. However, the objective in question probably can be secured by significant BNDE participation in the equity of existing institutions.

244. Political Intervention. All the region's state development banks are influenced to a greater or lesser degree by political factors. This influence is exercised through the directors who owe their appointment to the state governor and the political and economic interest he in turn represents. The prevalence of clientelism in state development banks activities can seriously inhibit the emergence of a development orientation and also have a demoralizing effect on professional and lower echelon staff. 1/ In addition, state governments intervene in state development banks' activities, diverting their resources to state infrastructure projects, as well as the financing of current public expenditures. 2/ Such advances frequently become revolving unpaid credits, with the state government taking advantage of the state development bank's resources to attenuate its own fiscal problems. Intervention of this type is more difficult to control as the state governments usually retain 90% or more of the equity in the state development banks. Under these circumstances, threats from the BNDE to suspend credit lines seem to have produced merely transitory improvements.

245. These points strengthen the case in favor of BNDE equity participation in order to remove the state development banks from direct involvement in the political arena. It appears that the BNDE lacks sufficient operational control to modify their behavior in this respect significantly, despite its importance as a source of their funds. With equity participation, the BNDE could more effectively exercise control over loan portfolios and the selection of directors. In addition, the BNDE would be in a stronger position to promote the fuller use of career professionals in directorships and so achieve greater continuity in management and increased reliance are more objective banking criteria.

246. **With administrative economies of scale, risk differentials and differences in promotional costs, the uniform spread to intermediaries under present programs has produced an institutional bias in favor of larger loans to medium-size firms. To overcome this bias, the introduction of a variable spread structure, differentiated by loan size and firm size, deserves serious consideration.**

1/ The high default rate on loan repayments and the associated liquidity difficulties experienced by the state development bank in Rio Grande do Norte in 1973 were due in large part to the use of political influence and favoritism in allocating loan financing. The Board of Directors of this bank resigned in late 1973, partly as the result of BNDE pressure.

2/ Examples include that of a state development bank, which has granted Cr$4 million to the prefecture of the state capital to build a football stadium.

247. The private commercial banking system does not seem to be an appropriate channel for official small-industry term credit. The commercial banks are inexperienced in term financing and have a well-attested preference for large-scale operations. The access of small firms to term credit again would require the removal of institutional bias via the introduction of a differential spread structure and an integrated loan guarantee and technical assistance scheme. Even then, it is difficult to assume that private commercial banks would be sufficiently motivated to carry out the developmental and promotional responsibilities required to establish a successful small-industry program. 1/ The argument that commercial banks provide the appropriate financing channel due to their branch networks and familiarity with local conditions is not persuasive in the context of the Northeast. If the geographical coverage furnished by the branches of the "mixed" state development banks is considered inadequate, the alternative might be to devise some means of incorporating the BNB's regional branch network directly into small- and medium-industry financing programs.

248. Greater geographical coverage for small industry programs also may be achieved by utilizing the Bank of Brazil's branch bank system as a supplementary channel for term financing. Integration of the branch networks of the state development banks, the BNB and the Bank of Brazil would provide excellent coverage for small-industry financing in the Northeast. The Bank of Brazil has acquired experience in small-industry financing through its management of the PASEP fund since 1971. The Bank of Brazil also administers the FUNDECE scheme (Capital Democratization Fund) which concedes financing for up to three years for working capital and fixed investment to firms with an "open" or widely-held equity structure. Although small- and medium-size firms are eligible for FUNDECE loans, their participation apparently has been negligible due in part to the prevalence of firms held in family ownership or by limited partnerships in these size categories. Therefore, if more extensive branch bank coverage than that provided by the state development banks and the BNB is regarded as a prerequisite for a successful small industry program in the Northeast, then the possibility of incorporating the Bank of Brazil as an intermediary for BNDE-FIPEME funds certainly merits further investigation.

1/ Such banks certainly could be induced to participate in a small-industry program if the returns were made sufficiently attractive. These institutions nevertheless may remain as passive retailers of funds rather borrowers. Some recent interviews with private commercial bankers lend support to this view.

C. Agro-Industries Development Program

Operational Aspects

249. In late May 1974, the Government announced the creation of an agro-industrial program for the Northeast which it considers an important step in the development plan for the region. The new program comprises a credit line of Cr$800 million to finance private sector industrial projects for the period 1974-77, for which the BNB has been designated as financial agent. The resources would come from the PROTERRA (Cr$200 million), BNB (Cr$200 million), and the federal budget (Cr$400 million). Initial appraisal and control of the execution of approved subprojects is to be vested in a joint BNB/SUDENE executive group to be established in Recife. An interministerial coordinating group, based in Brasilia, will assume overall responsibility for monitoring the program. The program adopts a wide definition of agro-industry, ranging from almost purely agricultural activities to enterprises engaged solely in the industrial processing of agricultural commodities. As financing for these two subsectors is already available through federal and state government credit lines (PROTERRA and BNDE/FIPEME) and fiscal incentive schemes (34/18 income tax credits), a certain degree of duplication of financial sources inevitably will arise. However, the relationship between these schemes and the new agro-industry program is intended to be complementary, and projects may combine financing from the various sources.

Prospective Beneficiaries

250. Agro-industries can be an efficient channel for providing small farmers with technical assistance, improved inputs, financing and market outlets. However, the new program does not have as its foremost objective raising the productivity and incomes of small farmers. Moreover, the Government seems to be interested in having this program move ahead as rapidly as possible. In the near term, the main impact will probably be acceleration of existing projects, including those in the SUDENE pipeline which satisfy the criteria of the new program. However, detailed implementation procedures are still under preparation and it should be possible to design project selection criteria which explicitly recognize backward linkages with small farmers and which give weight to positive effects on their productivity and incomes. 1/ The Government might even consider going as far as to require that a predetermined proportion of the raw material come from small farmers or that the industrial firm provide credit and technical assistance to small suppliers.

1/ The program is based on a pre-investment study prepared by a consortium of two consultants, A.D. Little and Montor, with specialized technical assistance from the Food Technology Institute in Campinas (ITAL). The study identifies seven products for which growing conditions are favorable and the market is expanding (pineapple, passion fruit, cotton seed, cashew, manioc, tomato and castor beans), and presents a number of possible subprojects without, however, any indications of the likelihood of their implementation. IPEA has also undertaken a feasibility study for a large-scale project in the upper Sao Francisco Valley, covering about 10,000 hectares now under irrigation, for the production, processing and transportation of deep-frozen vegetables, orange juice and meat. This project would also be included in the agro-industries program.

251. While the Government's interest in having the program move ahead as rapidly as possible is understandable, this could give it a bias toward large scale projects undertaken by well established enterprises, with project design left almost entirely to the firms' discretion. If necessary, however, speed of commitment of funds might be de-emphasized to secure projects whose characteristics meet investment criteria which take social, as well as private, opportunity costs into consideration.

252. The direct contribution of this program to rural development in this first phase arises primarily from the fact that the new projects would provide employment and labor legislation benefits for presently underemployed, poorly paid, landless laborers and sharecroppers. These groups form the lower two quintiles of the rural income distribution whereas the small-farm owners with over 20 hectares who are the most likely beneficiaries of rural development projects probably are found at the upper end of this distribution. It may well be that, under Northeast land tenure conditions, a plantation employing permanent wage labor may be as effective in reducing rural income inequality as a project which draws a high proportion of its raw material supplies from small-scale owner-operators.

Interest Rate Subsidies

253. Although the precise terms and conditions of this agro-industrial credit line have not been specified, the statement of the Economic Development Council creating the program refer to a "credit line with low financial charges." It is likely that this line will be furnished at subsidized interest rates comparable to those adopted under the PROTERRA scheme (17% nominal rate, without monetary correction). Indeed, it is precisely the interest rate subsidy and the guaranteed credit availability for agro-industry which constitute the modus operandi of the new program. The existence of alternative sources of federal financing also suggests that these conditions will have to be made relatively attractive to beneficiary firms. 1/ It is very likely that the interest rate subsidy will encourage firms to adopt relative capital-intensive techniques in their industrial and agricultural operations, diminishing the potential contribution of the new program to the solution of the region's severe employment problems. In addition, since the main clients of this subsidized credit line are likely to be large, well-established corporations, small-scale industrialists and/or farmers are unlikely to receive more than a

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1/ The Bank of Brazil has been the main source of financing of agro-industries with PROTERRA funds. Up to May 1974, 51 loans, for an average amount of Cr$2.3 million (US$350,000), have been committed. BNB has approved only two projects since 1972 and BASA three since 1973. BNDE has financed four agro-industries from PROTERRA and the average subloan comitted was about Cr$6 million. However, BNDE also has financed agro-industries through state and regional development banks, and has a sizeable pipeline of projects under study.

negligible share of this financing as direct beneficiaries. Even if projects with small-farmer supply participation are forthcoming, as matters now stand, the principal beneficiary of the subsidized loan, the firm controlling the processing plant, would presumably have no obligation to furnish credit and pass on the interest rate subsidy to his suppliers.

Employment Effects

254. The direct employment effects of the new program can only be estimated tentatively at this point. 1/ The Economic Development Council statement announcing the new program refers to the investment of Cr$517 million in 22 projects and the direct creation of 22,500 new jobs. This direct employment would be equivalent to 0.4% of the region's agricultural labor force in 1970, 2/ and would generate during its first phase (1974-77) about the same number of jobs as the 531 projects approved under the 34/18 scheme in the years 1965-73. 3/ The capital-labor ratio of approximately US$3,500 is remarkably low, particularly in comparison with other federal investment programs in the Northeast. For example, recent estimates of capital-labor ratios for 34/18 projects in manufacturing industry range between US$15,000 and US$20,000. The difference in capital-intensity is even more acute for 34/18 agricultural projects approved in the 1965-73 period, as these have a capital-labor ratio of US$27,690. Assuming that they have been correctly estimated, these positive employment effects constitute one of the most attractive features of the new program.

255. Some types of agro-industry processing plants also are likely to generate employment indirectly in agriculture and certain tertiary sectors, notably transport, via raw material purchases from independent producers. Unfortunately, there are no previous studies to provide a reliable basis for generalizations regarding the magnitude of these indirect effects. However, interviews with plant managers do suggest that these effects are substantial. Indirect employment effects also may be dispersed over a wide geographical area as plants dependent on external sources of raw materials often have extended supply lines. These backward linkages would significantly reinforce the positive direct employment effects of the new program.

1/ The data available are drawn mainly from the pre-investment studies undertaken by Montor-Arthur D. Little and may be drastically modified in subsequent stages of project formulation. The Montor-Arthur D. Little Report recommends approval of 17 projects with total investment amounting to Cr$374.4 thousand and total employment of 17,000.

2/ This proportion falls to 0.3% if the agricultural census estimate of the agricultural labor force of 7,815 is taken. The 1970 Demographic Census gives a figure of 5,158.

3/ Direct employment in these SUDENE-approved projects is 22,427.

Table 58: CHARACTERISTICS OF PROSPECTIVE BENEFICIARY PROJECTS IN THE NORTHEAST AGRO-INDUSTRY DEVELOPMENT PROGRAM

Number of Projects	Total investment (Cr$ million)	Final products	Projected processing capacity (thousand tons per year)	Size of landholdings (hectares)	Source of raw materials: Own holdings	Source of raw materials: External sources	Project location	% Output for foreign export markets
A. Agro-industry								
3	120	Pineapple juice and preserves, cashew and passion fruit juice	Pineapple: 43.2 Cashew: 1.7 Passion fruit: 7.2	n.a.	60%	40%	n.a.	45%
2	40	Tomato puree and pulp	28.8	n.a.	100%	--	Pernambuco	20%
2	90	Manioc pellets	240 (manioc)	n.a.	100%(?)	--	Bahia	100%(EEC)
1	123	Deep frozen products	Meat: 20 Concentrated orange juice: 10 Vegetables: 10	n.a.	100%(?)	--	Northern Minas Gerais	--
B. Agriculture								
2	18	Cashew nuts	18	10,000			Ceara; Rio Grande do Norte	(?)
3	33	Castor oil seed	7.5	6,300			Ceara; Bahia	(?)
3	93	Cotton and cotton seed	27	36,000 (arboreal cotton)			Ceara; Rio Grande do Norte	
2				13,000 (herbaceous cotton)			Pernambuco; Bahia	

Source: Statement issued by the Conselho de Desenvolvimento Economico on May 23, 1974.

ANNEX A

NORTHEAST BRAZIL: LAND DISTRIBUTION AT THE STATE LEVEL

DISTRIBUTION OF FARMS BY SIZE (ABSOLUTE VALUES)

Stratum (ha)	Number of establishments: Physical area (PA)[1]	Number of establishments: Equivalent area (EA)[2]	Area (ha): PA[1]	Area (ha): EA[2]
MARANHAO				
0 - 10	337,888	273,893.15	603,261	398,152
10 - 50	21,975	65,580.05	527,234	104,323
50 - 100	8,242	18,516.72	570,186	860,981
100 - 200	6,916	15,430.60	937,531	1,471,924
200 - 500	6,409	7,715.30	1,919,172	1,458,571
500 +	4,335	4,629.18	6,076,496	6,866,440
Total	385,765	385,765.00	10,633,880	11,160,391
PIAUI				
0 - 10	154,077	123,629.01	301,008	213,716
10 - 50	33,039	48,584.03	774,980	1,030,723
50 - 100	12,347	21,472.41	842,195	1,229,605
100 - 200	8,317	13,230.47	1,134,989	1,430,086
200 - 500	5,841	5,639.22	1,760,921	1,267,863
500 +	3,272	4,337.86	4,712,848	5,561,161
Total	216,893	216,893.00	9,526,941	10,733,154
CEARA				
0 - 10	120,470	120,400.84	473,507	705,525.43
10 - 50	80,482	86,983.47	1,847,039	1,883,979.70
50 - 100	21,360	21,131.58	1,482,746	1,482,746.00
100 - 200	12,576	5,897.18	1,734,815	850,059.35
200 - 500	7,464	5,897.18	2,232,726	2,165,744.20
500 +	3,364	5,405.75	4,319,467	9,805,190.00
Total	245,716	245,716.00	12,090,300	16,893,244.68
RIO GRANDE DO NORTE				
0 - 10	64,654	60,900.69	187,525	195,026.00
10 - 50	25,444	31,701.73	579,139	486,476.76
50 - 100	6,389	5,735.51	445,142	436,239.16
100 - 200	3,785	2,398.49	522,921	355,586.28
200 - 500	2,540	1,668.51	771,598	594,130.46
500 +	1,470	1,877.07	2,095,300	3,142,950.00
Total	104,282	104,282.00	4,601,625	5,210,408.07
PARAIBA				
0 - 10	116,076	112,504.91	373,380	436,854.60
10 - 50	38,194	40,447.38	801,305	865,409.40
50 - 100	7,303	6,457.98	494,406	420,245.10
100 - 200	4,168	3,568.88	557,249	490,379.12
200 - 500	2,855	2,379.25	833,642	791,959.90
500 +	1,351	4,588.56	1,540,243	6,222,581.70
Total	169,947	169,946.96	4,600,225	9,227,429.82
PERNAMBUCO				
0 - 10	257,289	216,525.65	697,554	481,312.26
10 - 50	52,401	85,549.19	1,125,364	1,485,480.40
50 - 100	10,407	13,263.44	726,578	719,312.22
100 - 200	5,783	4,973.79	797,793	510,587.52
200 - 500	3,847	3,315.86	1,178,199	812,957.31
500 +	1,859	7,958.07	1,887,014	6,453,587.80
Total	331,586	331,586.00	6,412,502	10,463,237.51
ALAGOAS				
0 - 10	79,104	83,895.22	232,315	302,009.50
10 - 50	19,510	16,336.38	416,832	425,168.64
50 - 100	3,227	2,318.71	226,759	195,012.74
100 - 200	1,682	737.77	233,476	142,420.36
200 - 500	1,206	948.56	371,169	419,420.97
500 +	667	1,159.36	755,541	2,349,732.50
Total	105,396	105,396.00	2,236,092	3,833,764.71
SERGIPE				
0 - 10	74,991	74,717.01	168,021	250,351.29
10 - 50	14,817	15,921.73	334,042	340,722.84
50 - 100	3,067	2,973.33	217,629	217,629.00
100 - 200	1,557	767.31	217,988	106,814.12
200 - 500	1,027	767.31	316,429	306,936.13
500 +	455	767.31	497,363	1,129,014.00
Total	95,914	95,914.00	1,751,472	2,351,467.38
BAHIA				
0 - 10	298,731	354,170.04	1,053,484	2,802,267
10 - 50	163,645	147,978.88	3,763,941	5,420,075
50 - 100	39,718	23,937.76	2,718,352	2,718,352
100 - 200	21,901	7,072.52	2,904,010	16,447,205
200 - 500	13,989	4,896.36	4,091,048	2,863,734
500 +	6,056	5,984.44	7,427,419	10,918,305
Total	544,040	544,040.00	21,958,254	41,169,938

PERCENTAGES

Stratum (ha)	Number of establishments: PA %	PA Cum. %	EA %	EA Cum. %	Area (ha): PA %	PA Cum. %	EA %	EA Cum. %
MARANHAO								
0 - 10	87.6	87.6	71.0	71.0	5.7	5.7	3.6	3.6
10 - 50	5.7	93.3	17.0	88.0	5.0	10.7	0.9	4.5
50 - 100	2.1	95.4	4.8	92.8	5.4	16.1	7.7	12.2
100 - 200	1.8	97.2	4.0	96.8	8.8	24.9	13.2	25.4
200 - 500	1.7	98.9	2.0	98.8	18.0	42.9	13.1	38.5
500 +	1.1	100.0	1.2	100.0	57.1	100.0	61.5	100.0
Total	100.0		100.0		100.0		100.0	
PIAUI								
0 - 10	71.0	71.0	57.0	57.0	3.2	3.2	2.0	2.0
10 - 50	15.3	86.3	22.4	79.4	8.1	11.3	9.6	11.6
50 - 100	5.7	92.0	9.9	89.3	8.8	20.1	11.5	23.1
100 - 200	3.8	95.8	6.1	95.4	11.9	32.0	13.3	36.4
200 - 500	2.7	98.5	2.6	98.0	18.5	50.5	11.8	48.2
500 +	1.5	100.0	2.0	100.0	49.5	100.0	51.8	100.0
Total	100.0		100.0		100.0		100.0	
CEARA								
0 - 10	49.0	49.0	49.0	4.9	3.9	3.9	4.2	4.2
10 - 50	32.8	81.8	35.4	84.4	15.3	19.2	11.2	15.4
50 - 100	8.7	90.5	8.6	93.0	12.3	31.5	8.8	24.2
100 - 200	5.1	95.6	2.4	95.4	14.3	45.8	5.0	29.2
200 - 500	3.0	98.6	2.4	97.8	18.5	64.3	12.8	42.0
500 +	1.4	100.0	2.2	100.0	35.7	100.0	58.0	100.0
Total	100.0		100.0		100.0			
RIO GRANDE DO NORTE								
0 - 10	62.0	62.0	58.4	58.4	4.1	4.1	3.8	3.8
10 - 50	24.4	86.4	30.4	88.8	12.6	16.7	9.3	13.1
50 - 100	6.1	92.5	5.5	94.3	9.7	26.4	8.4	21.5
100 - 200	3.6	96.1	2.3	96.6	11.4	37.8	6.8	28.3
200 - 500	2.5	98.6	1.6	98.2	16.7	54.5	11.4	39.7
500 +	1.4	100.0	1.8	100.0	45.5	100.0	60.3	100.0
Total	100.0		100.0					
PARAIBA								
0 - 10	68.4	68.4	66.2	66.2	8.1	8.1	4.7	4.7
10 - 50	22.5	90.9	23.8	90.0	17.4	25.5	9.4	14.1
50 - 100	4.3	95.2	3.8	93.8	10.8	36.3	4.6	18.7
100 - 200	2.4	97.6	2.1	95.9	12.1	48.4	5.3	24.0
200 - 500	1.7	99.3	1.4	97.3	18.1	66.5	8.6	32.6
500 +	0.7	100.0	2.7	100.0	33.5	100.0	67.4	100.0
Total	100.0		100.0		100.0		100.0	
PERNAMBUCO								
0 - 10	77.6	77.6	65.3	65.3	10.9	10.9	4.6	4.6
10 - 50	15.8	93.4	25.8	91.1	17.5	28.4	14.2	18.8
50 - 100	3.1	96.5	4.0	95.1	11.3	39.7	6.8	25.6
100 - 200	1.7	98.2	1.5	96.6	12.5	52.2	4.9	30.6
200 - 500	1.2	99.4	1.0	97.6	18.4	70.6	7.8	38.3
500 +	0.6	100.0	2.4	100.0	29.4	100.0	61.7	100.0
Total	100.0		100.0		100.0		100.0	
ALAGOAS								
0 - 10	75.1	75.1	79.6	79.6	10.4	10.4	7.9	7.9
10 - 50	18.5	93.6	15.5	95.1	18.7	29.1	11.1	19.0
50 - 100	3.1	96.7	2.2	97.3	10.1	39.2	5.1	24.1
100 - 200	1.6	98.3	0.7	98.0	10.4	49.6	3.7	27.8
200 - 500	1.6	99.4	0.9	98.9	16.6	66.2	10.9	38.7
500 +	0.6	100.0	1.1	100.0	33.8	100.0	61.3	100.0
Total	100.0		100.0		100.0		100.0	
SERGIPE								
0 - 10	78.2	78.2	77.9	77.9	9.6	9.6	10.6	10.6
10 - 50	15.4	93.6	16.6	94.5	19.1	28.7	14.5	25.1
50 - 100	3.2	96.8	3.1	97.6	12.4	41.1	9.3	34.4
100 - 200	1.6	98.4	0.8	98.4	12.4	53.5	4.6	39.0
200 - 500	1.1	99.5	0.8	99.2	18.1	71.6	13.0	52.0
500 +	0.5	100.0	0.8	100.0	28.4	100.0	48.0	100.0
Total	100.0		100.0		100.0		100.0	
BAHIA								
0 - 10	54.9	54.9	65.1	65.1	4.8	4.8	6.8	6.8
10 - 50	30.1	85.0	27.2	92.3	17.2	22.0	13.2	20.0
50 - 100	7.3	92.3	4.4	96.7	12.4	34.4	6.6	26.6
100 - 200	4.0	96.3	1.3	98.0	13.2	47.6	39.9	66.5
200 - 500	2.6	98.9	0.9	98.9	18.6	66.2	7.0	73.5
500 +	1.1	100.0	1.1	100.0	33.8	100.0	26.5	100.0
Total	100.0		100.0		100.0		100.0	

/1 From the Census of 1970.

/2 From the SUDENE-IBRD Survey.