DOCUMENT OF INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

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Report No. 38 -BR

THE ECONOMIC AND SOCIAL DEVELOPMENT OF BRAZIL

(In eight volumes)

VOLUME IV

THE NORTHEAST DEVELOPMENT EFFORT

March 12, 1973

Latin America and the Caribbean Department

CURRENCY EQUIVALENT

Currency Unit: Cruzeiro. (Prior to May 15, 1970, the currency unit was called the "Cruzeiro Novo" or "New Cruzeiro", the adjective was dropped in May 1970, without any change involved.)

Exchange Rates Effective December 15, 1972

Selling Rate:	US$1.00	= Cr$6,215
Buying Rate:	US$1.00	= Cr$6,165

Average Exchange Rates

US$1.00	= Cr$4.594	Cr$5.285
US$1 million	= Cr$4,594,000	Cr$5,285,000
Cr$1 million	= US$217,675	US$189,215

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THE NORTHEAST DEVELOPMENT EFFORT

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SUMMARY AND CONCLUSIONS

1. The Northeast, with about 28 million people, is the poorest region in Brazil. Its per capita GDP, US$180, is half of the national average. Moreover, income inequality is such that the per capita income of the poorest 50 percent of Northeast population is about US$50. Social indicators, such as high illiteracy, malnutrition and inadequate health facilities also manifest the region's underdevelopment. Regional income disparity has been a function of more than just poor soils and recurrent droughts. An archaic land tenure system, unfavorable interregional terms of trade and neglect by public policy until as recently as the late 1950's played major roles in hampering Northeast growth.

2. Until the 1950's, federal programs to aid the Northeast were largely concentrated on construction of hydraulic works in an attempt to temper the ravages of drought on agricultural production. Traditionally, a severe drought has been required to spur the authorities into action. After the 1958 drought, a Northeast regional development agency (SUDENE) was created and the emphasis of federal programs was shifted to more comprehensive regional development efforts. The thrust of the Government action in the Northeast during the 1960's was on heavy investment in infrastructure, mainly transport and power, and on industrialization, which was stimulated through an ingenious investment tax incentive scheme (known as the Art. 34/18 program). By most standards, Northeast economic growth in the last decade, was impressive. Much of the credit for the rapid growth of the Northeast during the 1960's is attributable to the considerable volume of federal resources transferred to the region. Federal policies have not narrowed the regional gap, but have prevented the gap from widening. On the other hand, those Northeasterners living at the subsistence level were not directly affected in significant degree by the Government's regional development efforts, although their situation was alleviated to some extent by inter-regional migration. Government policies in the 1960's had little impact on Northeast poverty, mainly because agriculture was relatively neglected. The main bottlenecks to agriculture development (highly skewed pattern of land tenure, lack of credit, extension and research facilities, marketing deficiencies) persisted despite some improvement of the programs for dealing with them. In addition, the industrialization program, which attained significant proportions only in the late 1960's, was not able to generate sufficient employment opportunities to keep pace with the rapid growth of the urban labor force. Thus, a pool of underemployed labor accumulated in the urban sector.

3. As in 1958, the 1970 drought jolted the Government into a major reformulation of its policy towards the Northeast. The vulnerability of the Northeast economy was stressed by the drought. The limited role of industry in absorbing surplus labor was recognized. It was decided that, for the time being, the main solution to agricultural underemployment and poverty must lie within agriculture itself. Two new dimensions were added to Government policy: labor mobility and agriculture. With the creation of the National Integration Program (PIN) in 1970 and the Program of North/Northeast Land Redistribution and Agricultural Development (PROTERRA) in 1971, 50 percent of the 34/18 income tax credit resources, corresponding to about US$280 million annually, were preempted and channelled to finance agricultural

development and related infrastructure in the Northeast and Amazon regions through 1976. Another principal component of the new regional development strategy is a program to reorganize the inefficient Northeast sugar industry. Together, these new programs constitute a major effort to ease the agricultural underemployment in the Northeast, by removing workers from this area to new agricultural frontiers and, more importantly, by increasing the productivity of workers remaining in the area.

4. Clearly, the Government has taken a political decision to change its regional policies so as to bring them to bear more directly on human welfare. Unfortunately, the institutional and informational base needed to make such a change effective is still far from having been created.

5. In addition to the construction of various irrigation works in the Northeast, the PIN is financing the construction of two Amazon highways and the colonization of areas adjacent to these roads. The Government balances the national security and political objectives of the Amazon roads against the Northeast underemployment problem. Had the second objective been paramount, the nature and the phasing of the program probably would have been different: more time for planning and surveying, construction periods spaced out, priority given to the more easily accessible preamazonian region in Maranhão and Goiás. A 1,000 km penetration road such as the Marabá-Altamira first section of the Transamazonica highway can be economically justified as a component of a colonization scheme. A 5,000 km construction program, in areas where the agricultural and agricultural environment is unknown, is more difficult to defend on economic grounds. Moreover, highway investment does not seem to be a necessary condition for prospecting and exploiting more remote mineral resources in the Amazon Region.

6. Preliminary studies of the construction of a third major Amazon highway have been undertaken. This would be a peripheral route, tracing virtually the 4,400 km northern border. Evidence of the economic justification of this massive additional road project has not yet been developed.

7. Government colonization schemes along the new Amazon highways are proceeding at a much slower pace than originally forecasted, as settlement policy still is in the process of definition. Regarding the planning of such projects, Brazilian authorities gradually are shifting from an ad hoc system which simply allocated fixed areas for settlement to a system which has as its basic objective the achievement of resettled family income targets. A number of different methods of promoting settlement are being used. Over the past few years, there has been a great deal of spontaneous settlement along the Belem-Brasília highway, which was largely unsuccessful as settlers acquired no legal tenure and were not assisted either financially or technically by the Government. Along the new Amazon highways, the Government has introduced limits on spontaneous settlement, although it will be difficult to enforce them fully once road access has been provided. The Government also has started to establish a controlled settlement in that area. Besides being very expensive (over US$10,000 per settler), this particular scheme absorbs an exorbitant amount of limited administrative talent. Fortunately, the Government has undertaken to experiment with an alternative controlled settlement model similar to the

IBRD-financed Alto Turi project in Maranhao, which represents a practical, low-cost approach to the problem, somewhere between the intensively administered schemes and undirected spontaneous settlement.

8. Another issue in colonization policy is the relative desirability of the various frontier regions and their settlement over time. The Central-West and the frontier Northeast states still appear to offer the best colonization alternative at present, in view of their proximity to markets and the quality of their soils.

9. Regardless of what mix of colonization techniques eventually emerges and where they are applied, the greatest need appears to be for the Government to prepare itself now for making adequate titling arrangements and for orienting settlers in terms of the cropping pattern and production techniques.

10. With regard to Northeast irrigation, the third component of the PIS, it appears that the Government rightly wants to proceed cautiously, by implementing only a few clearly viable projects i the next few years. Although a large number of irrigation projects have been tentatively identified, the viability of many of them is doubtful owing to various factors, e.g., overestimation of markets for high unit value products.

11. The aim of PROTERRA, promulgated in mid-1971, is to facilitate the access of Northeast peasants to the land, to create better conditions of rural employment and to stimulate the growth of agro-industry in the North and the Northeast. Not until late 1972 were the implementing regulations issued. The delay in the definition of the PROTERRA illustrates that technical and administrative limitations are serious constraints to implementing any North/Northeast agricultural development strategy. It also shows the difficulty of striking a balance between market-oriented policy instruments -- such as credit price incentives -- and programs directed to structural factors such as unsatisfactory land tenure, inadequate research and extension, poor rural education, etc.

12. Nevertheless, PROTERRA may bring about the first significant progress in agrarian reform to be made in the Northeast. In certain designated areas of that region, under-exploited lands in properties of 1,000 hectares or greater will be redistributed to an estimated 15,000 families in 1973. Owners who cooperate with PROTERRA by presenting acceptable programs for splitting up their estates will be exempt from expropriation and paid for their land in cash. The program thus seeks to place as much of the administrative burden of land reform as possible on the landowners, thus limiting the role played by INCRA, the Government agrarian reform agency. Whether this will prove to be compatible with the social goals of the program remains to be seen, however. Although the limited technical capacity of INCRA is recognized, more Government participation in the program may be needed to avoid biases in the redistribution of land as well as to assure ready availability of extension services, inputs and credit to the beneficiaries. Finally, if the target is to reach the maximum number of families within the existing financial constraints, compensation procedures should perhaps be modified to lower capital costs to the Government.

13. In terms of financial resources, the agricultural credit component of PROTERRA is more important than its land reform component. Involved is a series of credit lines for fertilixers, improved seeds, farm mechanizations, farm improvement and agro-industries. These credit lines bear nominal interests rates varying from zero (for fertilizers) to 17 percent (for agro-industries).

14. PROTERRA plans for massive injections of subsidized credit assume that increased use of modern inputs is economic and that distortions in relative prices are impeding their application. Certainly, this [illegible] certain extent, as is demonstrated by the high cost of fertilizer. On the other hand, the use of subsidized credit as a rural development technique ignores two problems. The first is the problem of equity; existing credit mechanisms simply are not capable of extending credit -- subsidized or not -- to the majority of small farmers. Further, negative real interest rates [illegible] excess credit demand and in the rationing process funds are mainly absorbed by those who are first into the credit market. The second problem applies over the entire range of potential subsidized credit beneficiaries. Present knowledge of optimum agriculture production functions in the Northeast is far from sufficient to justify a massive shift in production techniques. Moreover, the Government is not yet instututionally organized to [illegible] volume of research needed in the Northeast. Fortunately, appropriate institutional changes at the national level are under consideration.

15. The sugar industry reorganization program centers on the [illegible] of subsidized credit for producers who agree to merge and to [illegible] sugar mills and/or to integrate and relocate cane [illegible] and milling. [illegible] stimulus to achieve economies of scale through the program is constituted by the fact that the present [illegible]0 percent difference between Government-fixed producer prices for the Northeast and the [illegible] the inter-regional production cost differential) will be [illegible] eliminated by 1979. Although improvement of the efficiency of [illegible] sugar production is a <u>sine</u> <u>qua</u> <u>non</u> for the development of the [illegible], the reorganization program does need to take more [illegible] into account the problem of the cane field and mill workers who will be displaced [illegible]. At least some of the areas which have been designated for land [illegible] the sugar zone. However, no effort is being made either to insure that displaced sugar workers will be the beneficiaries of the reform or to design production and marketing systems that would permit the redistributed land to be employed in the production of other crops. This situation is attributable to a lack of coordination between Brazil's sugar institute (IAA) which is administering the sugar reorganization program, and INCRA, the agrarian reform agency.

16. The recent reorientation of the Government's regional development strategy is certainly a step in the right direction. For the first time, Government programs are tackling on an appropriate scale the problems of Northeast agriculture. It should be emphasized, however, that the efficiency of regional development resource allocation is impeded by two factors. The first is the presence of numerous loosely coordinated agents participating in the regional development process. The second is the shortage of technical talent in agencies dealing with Northeast agriculture. Fortunately, the Government is aware of the problem and is working toward its solution. Finally, there is

a danger that the desire of obtaining quick production results may jeopardize adequate focus on structural problems. If the ultimate goal of PROTERRA is, in fact, one of alleviating poverty, its emphasis should be on the rural poor.

17. Northeast development agencies, which are engaged in indicative planning for Northeast development in the 1970's, consider a 10 percent regional growth target feasible. This reflects both the concern of the Government with narrowing the interregional per capita income gap and its ambitious national growth targets. With an expected population growth of 2.4 percent, 10 percent regional growth would double the per capita income of the Northeasterners by 1980. Expansion of Northeast industrial and agricultural output will have to be accelerated if this regional growth path is to be achieved.

18. Detailed analysis of the demand for and supply of Northeast agricultural products suggests that the targeted 6.5 percent regional agricultural growth rate is feasible provided that adequate Government policies are implemented. In addition to improving the efficiency of existing programs, along the lines suggested in the preceding paragraphs, the Government might consider the desirability of promoting interregional production shifts. Labor-intensive crops such as sugar and cotton, which are grown both in the northeast and in the Center-South, will become increasingly inappropriate in the Center-South where they are already encountering stiff competition from other products (soybean, corn, pasture). In the Northeast alternative agricultural opportunities are less attractive and labor is abundant.

19. Despite the shift in government policies, manufacturing industry is likely to remain the leading sector for regional growth. Notwithstanding its lack of carefully formulated priorities and the factor bias implied by its capital subsidization, the 34/18 industrialization process does not appear to have brought about serious resource misallocation. Having concentrated on resource-based activities, the industrialization program successfully broadened the region's economic base and exposed it generally to a modernization process. Newly installed subsidiaries of Southern firms have brought with them an inflow of experienced senior managerial staff that is already providing a stimulus to local entrepreneurship. Lack of local entreprenuerial capacity is the main cause of the failures which have occurred. As a result of the great improvement in the federal highway system which accompanied the industrialization program, transport costs no longer constitute a barrier to efficient development of Northeast industry. The new firms have close linkages to the region, which is providing most of their inputs as well as their principal markets. Thus, fears that newly installed industries would be burdened by heavy transport costs would appear to have been unwarranted. Despite SUDENE's efforts to disperse industrialization throughout the Northeast, most new firms are concentrated in three main growth poles so that economies of scale and external economies are being exploited.

20. However, major bottlenecks must be eliminated before the growth of Northeast industry becomes self-sustaining. Interindustry relations in the Northeast still are primitive due to the lack of subcontractors, component suppliers, maintenance units, etc. Regional development agencies should promote the installation of small and medium industries which could exploit the linkages of the industrialization program. Another bottleneck facing Northeast

industry is the shortage of skilled blue collar workers as well as of middle level manpower. Hopefully, regional education reform will respond to this need.

21. Looking toward the future, projects already approved by SUDENE but not yet in operation will account for most of the expected 15 percent increase in regional manufacturing output throughout the mid-1970's. For new industrial projects, SUDENE should increasingly emphasize exploitation of regional natural resources (mineral and agricultural) as well as the use of cheap labor since it is in this way that the region's comparative advantages can be exploited. This does not mean that Northeast industry can be expected to reduce significantly the regional pool of underemployed urban labor. Physical resource-based industries necessarily tend to be capital intensive. In any case, if Northeast industry is to compete in the rest of Brazil as well as abroad, the choice of techniques is, in practice, very narrow. Labor absorption by industry can be improved economically, however, by directing new investment to labor-intensive industry branches such as garment production, appliance assembly, etc. SUDENE should also give more emphasis to production for export abroad. The recent decision of the Federal Government, (allowing duty-free transfer to Brazil of entire used industrial establishments on condition that at least one-third of their output be exported) should have a positive impact on Northeast exports.

22. Rapid growth, however, is not sufficient of itself to insure visible improvement of the quality of life for the Northeast poor. Another necessary condition is that the policy mix emphasize that aim. The present regional development policy does contain ingredients -- land reform and colonization -- oriented to a rapid increase in the incomes of the poorest sections of the population. Migration to the Center-South can be expected to continue to alleviate the Northeast surplus labor problem. Another area which is increasingly receiving Government attention is education. Quantitatively, the education and training system of the Northeast has responded impressively to the growing national commitment to education. Despite these gains, however, there remain significant interregional and intraregional disparities reflected in the distribution of educational opportunities and attainments as well as in the efficiency and quality of the education system. The same is true of public health: only about 30 and 7 percent of Northeast urban dwellers are served by adequate water and sewerage facilities, respectively, as compared to 91 and 36 percent in the Center-South. It is difficult to see how local governments in the region can generate the resources needed to overcome these disparities, even gradually.

23. The massive problems of adequate rates of job creation and expansion of social infrastructure would be simplified in the future if fertility and demographic growth rates were reduced. There are indications that regional rural-urban migration is reducing fertility rates but mortality rates also appear to be declining in the Northeast. Brazil's Family Welfare Society (BEMFAM) -- an affiliate of the International Planned Parenthood Federation -- is active in the Northeast as it is elsewhere in Brazil. Recent relaxation of official attitudes toward family planning portend an increase in organized family planning activity in the future. At least during the decade of the 1970's, however, it is unlikely that regional fertility decline will be of sufficient magnitude to, say, ease pressure on the schools.

24. In order to improve the living conditions of the poorest sections of the Northeast society as well as to achieve the concomitant goal of regional growth, it is necessary to increase the productivity of the existing capital stock and to stimulate a rapid growth of investment while improving the administrative structures. A 10 percent growth path is likely to require a 14 percent annual increase in regional investment. Moreover, an increasing share of the total investment burden is likely to have to be borne by the public sector. Government investment plans and an independent estimate of needs for education and feeder roads indicate a 22 percent rate of public sector investment growth over the next 5 years.

25. The adequacy of resources to meet such public investment requirements is almost entirely predicated on the flow of federal funds to the Northeast in the form of direct federal investment and federal transfers to the states. Fortunately, the strong fiscal situation which is expected to prevail at the national level for at least the next few years bodes well for the timely channelling of needed federal resources to the Northeast. However, the regional need for transferred resources does seem to be greater than the amounts presently budgeted by the Federal Government. The size of this gap between needs and already budgeted allocation may be estimated at Cr$600 million in 1971 prices annually over the 1972-76 period. Unfortunately, it is precisely the social investment programs of the local governments which are most likely to be jeopardized by failure to fill this gap.

26. The northeastern states, whose taxing powers are virtually limited to the imposition of a value-added tax (ICM), are urging the Federal Government to make substantial changes in ICM administration which would raise their share of overall ICM collections. Since the ICM is paid to the state of origin of the product rather than to the state of destination, Northeast consumers are paying a substantial amount in ICM taxes to states located outside the Northeast as a result of the interregional trade deficit. The Northeast states are advocating that the ICM revenues generated by interstate trade be equally split between the exporting state and the importing state. The adoption of such arrangement would certainly increase the revenues of all Northeast states, although in a very uneven way. But since the bulk of Brazil's interstate trade takes place in the more affluent Center-South, ICM splitting might well prove to be a very inefficient way of responding to the resource needs of the Northeast. Both from an administrative and political standpoint, it may be desirable to increase instead federal revenue-sharing with the Northeast by increasing the magnitude of the so-called Special Fund which presently allocates 2 percent of federal income and sales tax revenues to the Northeast. 1/

1/ The Federal Government maintains two revenue sharing funds, the Participation Fund containing 10 percent of federal income and sales tax receipts, and the above-mentioned Special Fund which is destined almost exclusively to the Northeast. Participation Fund distribution also is welfare oriented, the Northeast receiving about 40 percent of these resources.

7. Any additional transfer of resources (whether federal or state) to the Northeast will be either directly or indirectly at the expense of the other states. The advocates of the richer states, such as Sao Paulo, argue that a reduction of resource availability for investment in the Center-South would impair the rate of growth of the overall Brazilian economy and, in turn, absorption by the Center-South of Northeast surplus labor, as well as Center-South resource transfers to the Northeast. Their argument is based on the hypothesis that the productivity of capital is higher in the Center-South than in the Northeast, a hypothesis which has yet to be demonstrated. But even assuming that a productivity differential exists, it must be recalled that the additional interregional transfer suggested here is marginal for the Center-South economy, but substantial for the Northeast. Moreover, the purpose of the transfer is to decrease the disparity between the availability of public services provided by the Center-South states and those available in the Northeast states. Finally, the additional resource transfer is advocated within the context of an increased tax effort on the part of the Northeast states as well as increased Northeast absorptive capacity.

8. Expansion of private sector investment will also be essential to achieving the rapid growth targeted for the Northeast economy even though the pace of its expansion need not equal that of public investment. The amount of resources available for Northeast private investment in the next few years mainly depends on the flow of the 34/18 funds and the expansion of credit by the regional banking system. As a result of the allocation of 30 percent of 34/18 funds for the PIN and PROTERRA program, there will be a serious reduction in the availability of such resources for private investment. The impact of this shrinking could fall primarily on industrial investment which receives the lion's share of 34/18 resources in the past. Two possible offsetting measures are: a shift of all SUDENE agricultural projects to the PROTERRA scheme; and, more importantly, a reduction in the maximum contribution of 34/18 funds to industrial project cost. A potential absorber of scarce 34/18 funds is the Bahia petrochemical complex. Given the national role of this project and its low labor absorption, a smaller participation of 34/18 funds than presently envisaged, associated with a larger inflow of external resources, may be justified.

9. Another question which arises as a result of the shift in regional policy is the prospective amount of resources available to the Bank of the Northeast (BNB). Besides Federal Government contributions to the bank's capital, a principal source of the BNB's loanable funds has been the deposits of the 34/18 investment funds of the private sector. These resources are held in blocked BNB accounts pending SUDENE approval of an investment project to which they may be applied. As a consequence of the diversion of 30 percent of 34/18 investment funds for PIN, coupled with more rapid approval by SUDENE and implementation by investors of 34/18 projects, the 34/18 deposits are projected to decline very rapidly in the next few years. The 34/18 funds (20 percent) diverted to PROTERRA will continue to be deposited in the BNB which will transfer them to the agricultural sector. However, the "float" emerging from this operation is likely to be of relatively short term. Thus the BNB will need to find additional resources in order to expand industrial credit. To fulfill its mandate as a development bank, the BNB also needs to be more aggressive in its industrial lending and more oriented towards the small farmer in its agricultural lending.

30. Overall, the outlook for this volume of resources which can be expected to be mobilized outside the region to support Northeast investment is good. This conclusion is based on prospects for continuation of rapid national economic growth and of good federal fiscal management. These are the two main factors affecting the flow of private and public savings to the Northeast. However, gaps in the financing of the projected regional investment program are likely to arise unless presently budgeted federal transfers are increased and means are found to permit the BNB to expand its lending beyond presently envisaged levels.

31. External assistance so far has played a minor role in the development of the Northeast. It is unlikely that the role of external assistance could be expanded substantially in quantitative terms. In any case, as indicated, Federal Government funds will cover the bulk of required public investment financing. Moreover, individual projects suitable for external financing not only are sparse but also tend to be small and to have only minor foreign exchange components. This is not to say that, quantitatively, external assistance cannot be significant. Some projects — such as the Bahia petrochemical pole — are bulky and, in a marginal sense all investment resources are important. Rather, these comments are designed to emphasize the fact that external assistance can have much greater qualitative than quantitative impact. Northeast regional development is impeded by the lack of technical information on resource potential and development methodology. It is in the field of technical assistance that foreign aid can play a major role for the development of the region. There is a clear need to increase the Northeast's absorptive capacity by improving the operating efficiency of economic and social institutions and by identifying, through research, the region's comparative advantages in agriculture as well as in industry.

32. Project lending has to be preceded by substantial assistance in project preparation, in many cases with a long lead time. Considerable technical assistance in the organization and management of project institutions in sectors such as agriculture and education will be needed. These problems and the relatively small size of individual projects should not deter official lending agencies from seeking to direct their lending to the following three priority areas: <u>welfare projects</u> (nutrition, low-cost housing, sewerage); <u>production projects</u> (agricultural credit, agro-industry, feeder roads, tourism, industry); and <u>long-term projects</u> (agricultural research, education). An appropriate mix of lending in these three areas is essential for the success of assistance in the Northeast.

I. THE PROBLEM

1. The Northeast, with about 28 million people, is the poorest region in Brazil and its per capita income ranks among the lowest in comparison with other countries in Latin America. Social indicators such as high illiteracy malnutrition, and inadequate health facilities also manifest the area's underdevelopment.

Table 1: SOCIO-ECONOMIC INDICATORS

		Northeast Brazil (1)	All Brazil (2)	(1) : (2) %
1.	Population, 1970 (million)	28.3	93.2	30.4
2.	GDP at Factor Cost 1970 (US$ billion equivalent)	4.7	31.5	14.9
3.	Share of Agriculture in GDP, 1969	30.2	21.0	143.8
4.	Per Capita GDP, 1970 (US$ equivalent)	166	338	49.1
5.	Per Capita Income of Labor Force /1 1970 (US$ equivalent)	408	832	55.7
6.	Per Capita Income of Poorest 50 percent of Labor Force /1, 1970 (US$ equivalent)	132	228	57.9
7.	Per Capita KWh Consumption, 1970	106	355	29.9
8.	Per Capita Gasoline Consumption (liters)	43	100	43.0
9.	Per Capita Cement Consumption, 1970 (kg)	46	97	47.5
10.	Illiteracy Rate, 1970 (% Labor force)	54.8	29.7	184.5
11.	Enrollment Ratio, 1970 (% primary)	45	70	26.9
12.	Percent of Urban Population Supplied with Water, 1970	30	51	58.8
13.	Percent of Urban Population Served by Sewerage, 1970	7	26	26.9
14.	Mortality Rate, 1970 (Per '000 population)	13.0	9.7 /2	134.0
15.	Infant Mortality Rate, 1970 (Per '000 l.b.)	137.4	75.1 /2	183.0
16.	Life Expectancy, 1970 (Years of Age)	49	61 /2	80.3
17.	Availability of Medical Doctors, 1968 (Per 10,000 population)	2.3	6.2	37.1
18.	Hospital Beds, 1968 (per '000 population)	1.9	3.6	94.0
19.	Protein Daily Intake, 1970 (as % of minimum requirement)	75	n.a.	n.a.
20.	Calorie Daily Intake, 1970 (as % of minimum requirement)	77	n.a.	n.a.

/1 Labor force is 29 percent of total population in the Northeast, as against 32 percent in Brazil.

/2 Only Center-South.

2. Relatively poor resource endowment, archaic land tenure system, unfavorable interregional terms of trade, neglect by public policy until as recently as the late 1950's, are the main causes of Northeast's backwardness. Regional income disparity has been a function of more than just poor soils and adverse climatic conditions, such as recurrent droughts and unpredictability of rainfall. The Northeast, which had been the affluent region of Brazil in the early 1800's, producing the major export crops of sugar and cotton, suffered a setback due to a shift in Brazil's comparative advantage in production for export. The export-generated economic growth gradually shifted to the Center-South as coffee became the leading export commodity. Thus, the exchange rate -- the same for the Northeast as well as for the Center-South -- more and more reflected the relation between the world market price for coffee and the cost of coffee production in the Center-South. This, in turn, led to a relatively overvalued exchange rate for sugar and cotton producers in the Northeast. [illegible] shifted only marginally to coffee production, as it was not particularly suited to the climatic conditions of the Northeast. Hence, when the process of industrialization began in Brazil, it was concentrated in the Center-South where internal savings were being generated and where domestic demand was growing faster. Furthermore, when world market conditions for sugar and cotton improved to a point in the early 1900's such that there was again a price incentive at the existing Brazilian exchange rate to expand sugar and cotton production, the response was greatest in the Southeast. There, the adoption of new [illegible] techniques in agriculture, coupled with lower transportation [illegible] (derived from external economies accruing to agriculture in the Center-South as a result of the investment in infrastructure such as roads and ports to support industrialization of the region), and the relative availability of capital made sugar and cotton production more competitive than in the Northeast.

3. To make matters for the Northeast worse, the [illegible] pursued by the Brazilian Government over the period roughly from 1[illegible] to 19[illegible] designed to promote import-substituting industrialization favored the rapid development of the Center-South region at the expense of the Northeast. This outcome was a consequence of exchange and trade policies which caused the internal interregional terms-of-trade for the Northeast to deteriorate [illegible]. Industry of the Center-South absorbed raw materials from the Northeast in exchange for highly protected manufactured products. The Northeast incurred interregional trade deficits with the Center-South because import-substitution policies constrained the supply of most manufactured goods to those produced domestically. The financing of this interregional trade deficit within Brazil came from the trade surplus that the Northeast ran with the rest of the world. Thus the surplus foreign exchange earned in the Northeast from the region's exports to world markets was converted into domestic currency to cover the interregional trade deficit with the Center-South. Furthermore, the foreign exchange surplus generated by the Northeast was used to finance the import of capital and intermediate goods to further the process of industrialization in the Center-South. In the absence of the import-substitution policies, the Northeast would have fared better at the time by (a) exporting more of its raw material production to the rest of the world rather than supplying the demand of domestic industry in the Center-South; and (b) by using all the region's net foreign exchange earnings to satisfy the region's demand for manufactured goods

and capital equipment through cheaper imports from abroad. Private capital flight from the Northeast to more remunerative investments in the Center-South was another feature of interregional flows.

4. The most relevant measure of the degree to which regional economic disparity had developed in Brazil by 1960, was that the per capita income in the Northeast was only 45 percent of the national average. With about 32 percent of the national population, the Northeast accounted for less than 15 percent of Brazil's GDP. Whereas agriculture accounted for 23 percent of national GDP and employed about 54 percent of the labor force, in the Northeast it accounted for 40 percent of regional GDP and employed about 75 percent of the regional labor force. Productivity in the sector was low indeed. Moreover, as compared to 20 percent in the case of agriculture, industrial production in the Northeast made up less than 10 percent of total industrial output in Brazil. Although the Northeast contained half of the total population of Brazil in the middle 1800's, the depressing economic conditions of the subsequent hundred years both induced regional out-migration and discouraged the many foreign immigrants to Brazil from settling in the region, so that by 1960 the proportion of Brazil's total population located in the Northeast had declined to the above-mentioned 32 percent.

II. RECENT PERFORMANCE

A. Economic Growth

5. Brazilian economic policies have only gradually come to approach regional underdevelopment in comprehensive fashion. Until the 1950's federal programs to aid the Northeast were largely concentrated on construction of hydraulic works in an attempt to temper the ravages of drought on agricultural output. Traditionally, a severe drought has been required to spur the authorities into action. After the 1958 drought, a Northeast regional development agency (SUDENE) was created and the emphasis of federal programs was shifted to more comprehensive regional development efforts. The thrust of the Government action in the Northeast during the 1960's was on heavy investment in infrastructure, mainly transport and power, and on industrialization, which was stimulated through the mechanism of the Article 34/18 tax incentive (see para. 59).

6. Although lack of administrative capacity coupled with increasing centralization at the federal level in the decision-making process since 1964 prevented SUDENE from coordinating efficiently the various Government agencies operating in the Northeast, by most standards economic growth in the last decade was impressive. This is confirmed by the following output data for key products.

Table 2: REAL OUTPUT INDICATORS, 1960-70

	1960	1970	Annual Growth Rate %
Principal Agricultural Products /1 (1960-61 = 100)			
Sugar Cane	100	131.7/2	3.5
Manioc	100	165.6/2	6.5
Cotton	100	118.5/2	2.1
Cocoa	100	113.2/2	1.6
Beans	100	172.0/2	7.0
Meat Production /3 (1965 = 100)	100	116.7	3.1
Electric Power Production ('000 MWh)	1,600/4	3,860	10.9
Cement Production (000 tons)	577	1,003	5.7
Natural Gas Production (million m^3)	535	1,263	9.0
Petroleum Production (million barrels)	30	51	7.4
Salt ('000 tons)	820	1,541	6.5
Lead ('000 tons)	71	249/5	15.0
Paved Federal Highways (km)	1,433	6,252	15.9

/1 Accounting for 61 percent of value of total agricultural production in 1969; series from 1960-61 to 1968-69.
/2 Average 1968-69.
/3 Series from 1965 to 1970.
/4 1962.
/5 1969.

7. During 1960-69, the growth of the Northeast, at 6.5 percent per annum, was more rapid than in Brazil as a whole (5.2 percent). Growth came to a halt in 1970, when the region was hit by a severe drought, which caused a 17 percent reduction in agricultural production. Federal Government relief projects involving the construction of roads, dams, cisterns, and irrigation canals and employing nearly half a million workers substantially alleviated the situation. Despite the large recovery in 1971 (a 9.6 percent increase in regional GDP), the Northeast has not kept pace with the accelerated growth which the rest of the country has experienced in the last few years (see Appendix, Table 1). In 1971, regional per capita GDP, at the equivalent of US$180, was still only about 48 percent of the national average. Since the creation of SUDENE, therefore, government policies have not narrowed the regional income gap. On the other hand, they have prevented the gap from widening.

8. Much of the credit for the rapid economic growth of the Northeast during the 1960's is attributable to the considerable volume of resources (especially for investment) made available to the region from the rest of Brazil. The transfer of resources to the Northeast has taken the form of (i) direct investment expenditure by the Federal Government and federal autarkies; (ii) transfers from the Federal Government ot the state and municipal governments in the region; (iii) the Article 34/18 Investment Tax Credit funds, and (iv) the expansion of official bank credit in the region over and above the

increase of regional savings captured by the official banking system. As federal taxes collected in the region have, by and large, usually equalled federal current expenditures in the Northeast, items (i) through (iv) represent the total net inflow of federal resources. In 1970, this net inflow was US$840 million equivalent, amounting to about 15 percent of the gross regional product, or 55 percent of gross regional investment. This sizable inter-regional resource transfer corresponded to roughly 2.2 percent of Brazil's GDP (see Appendix, Table 5).

B. Investment

9. The basis for a more rapid growth was established during the late 1960's when gross capital formation, at 25 percent of gross regional product, reached levels much higher than both the historical Northeast average 1/ and the level for Brazil as a whole.

1/ According to Singer (International Development, pg. 236), the investment coefficient in the Northeast during the 1939-50 period was as low as 7 percent.

Table 3: FIXED INVESTMENT, 1966-71

(In 1971 Cr$ millions)

	Actual				Estimate		Average Annual Increase
	1966	1967	1968	1969	1970	1971	1966-71
							(In percent)
Total Fixed Investment	4,908	5,053	6,403	7,065	7,000	7,500	9.0
Public Sector Fixed Investment	2,269	2,225	2,715	2,767	2,530	3,000	5.7
Federal	1,360	1,430	1,500	1,530	1,405	1,852	6.4
States	700	588	874	946	900	925	5.7
Municipalities	209	207	341	291	225	223	1.4
Private Sector Fixed Investment	2,639	2,828	3,688	4,298	4,470	4,500	11.3
SUDENE approved projects	275	880	1,290	1,607	2,005	1,940	48.0
(Art. 34/18 investment funds)	(120)	(387)	(568)	(707)	(882)	(854)	48.0
(Supplementary funds)	(155)	(493)	(722)	(900)	(1,123)	(1,086)	48.0
Other Private Investment	2,364	1,948	2,398	2,691	2,465	2,560	1.6

Sources: SUDENE; Bank of Northeast Brazil; and IBRD Mission estimates.

Public Investment

10. An upward shift in public investment contributed substantially to this increase in aggregate investment. A measure of the concentration of public sector resources in the Northeast is the fact that in 1969 public fixed investment there amounted to 11 percent of the region's GDP compared to 9 percent nationwide. Public fixed investment in the Northeast has concentrated on road construction and electric power. Important investment in mining and

manufacturing have also been made in the area by mixed government enterprises. On the other hand, direct investment in agriculture and social infrastructure has been relatively small.

Private Investment

Private investment reached 16 percent of regional GDP in 1969. Impressive growth in private investment was stimulated by the investment tax credit mechanism known as the Arricle 34/18 scheme. Starting in 1962, Brazilian corporations were allowed to deduct up to 50 percent of their income tax liabilities for investment in SUDENE-approved projects in the Northeast. Pending SUDENE's approval of respective investments, these tax credit funds are deposited in non-interest bearing accounts with the Bank of the Northeast (BNB), a regional development bank established in 1954 with a majority of government capital. The 34/18 deposits have constituted the major source of BNB's loanable funds, thus significantly contributing to liquidity in the Northeast. These deposits grew very rapidly in the early and mid-1960's when the proportion of firms using the investment tax incentives rose substantially. Accruals to BNB slowed down in the late 60's when the Northeast began to compete with alternative allocations of 34/18 funds, as the scheme was extended to investments in the Amazon region as well as in sectors such as fishing, tourism and reforestation throughout the country. Thus, by 1970 the Northeast share in total tax credit deposits had declined to 50 percent. Moreover, in the late 1960's the pace of investment approval and implementation increased, thus reducing the average term of tax credit deposits in the BNB. Recent initiatives with regard to fiscal incentives have further reduced the accrual of 34/18 private investment funds to the Northeast. As discussed below, with the creation of PIN in 1970 and PROTERRA in 1971, 50 percent of all investment tax credit resources have been earmarked for government-directed investment in North/Northeast agriculture and related infrastructure through 1976.

12. The 34/18 scheme led to sizeable interregional resource transfer, as about 80 percent of deposits were made by Sao Paulo and Rio firms. In addition to the tax credit resources themselves, investing firms had to provide additional funding on their own account for approved investments. These counterpart funds averaged about 31 percent of the 34/18 resources applied in approved projects. The main beneficiary of the incentive scheme was manufacturing industry. Despite the extension of the 34/18 mechanism to agriculture, telecommunications and power projects starting in 1966, manufacturing captured about 80 percent of all investment funds. The share of manufacturing investment in Northeast gross capital formation grew from 9 percent in 1965 to 20 percent in 1969.

External Financing

13. External financing agencies have not been able to lend as much in the Northeast as they would have liked. Project lending for the Northeast has had to be preceded by substantial assistance in project preparation, in many cases with a long lead time. Considerable technical assistance in the

Table 4: PUBLIC SECTOR INVESTMENT

(In 1971 Cr$ millions)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Total Public Sector Investment	1,118	1,259	1,627	1,506	1,461	2,036	2,269	2,225	2,715	2,767
Agriculture	92	77	79	94	65	78	95	99	80	92
Industry	453	567	680	660	801	1,082	1,006	1,034	1,124	1,104
Manufacturing	1	1	13	228	158	129	55	85	106	124
Construction	-	-	-	-	-	-	-	-	-	-
Mineral Extraction	296	397	369	265	326	408	438	450	392	392
Electricity and Water Supply	154	169	298	167	307	545	513	499	626	587
Services	573	615	909	752	615	876	1,168	1,092	1,511	1,569
Commerce	-	-	-	-	-	-	-	-	-	-
Transport, Storage and Communications	60	362	560	414	267	472	673	685	871	942
Financial Intermediation	10	6	45	26	21	29	31	14	34	35
Community and Public Services	403	247	284	312	327	375	464	393	606	592
	(In percent)									
Ratio of Public Sector Investment in Northeast to Gross Regional Product at Factor Cost	7.5	8.0	9.9	8.6	7.9	10.5	11.2	9.9	11.1	10.3

Source: SUDENE, Assessoria Tecnica.

organization and management of project institutions in sectors such as agriculture and education was needed. The large transfer of funds by the Federal Government from the Center-South to the Northeast created a situation in some sectors in which external financial assistance was not needed.

14. To date, the United States Agency for International Development (USAID) and the Inter-American Development Bank (IDB) have provided the bulk of official external resources flowing into the area. Since the early sixties, USAID and the IDB have made special efforts to develop and finance projects in the region. USAID has maintained a large resident mission in the Northeast geared to technical assistance and project financing. By the end of 1971 had committed more than $300 million of loans and grants for specific projects in the Northeast. Its program is now being phased out. IDB committed $220 million in the Northeast up to the end of 1971. Both institutions have concentrated their project lending in the Northeast on road construction, electric power and industry. Largely because of the role played by these external financing agencies, the IBRD has financed only two purely Northeastern projects in recent years, 1/ namely a $25 million industrial line of credit to the BNB made in 1970 and a $6.7 million loan for land settlement in Maranhoa made in 1972. However, a substantial part of recent IBRD highway and education loans will be used in the region.

C. Demographic Growth and Migration 2/

15. The 1970 census sheds considerable light on trends in population, migration, employment and income distribution. A rate of natural demographic increase of 3.0 percent for the region has been reduced by out-migration to give a total population growth of about 2.5 percent per annum through the sixties. Although this is slower than for Brazil as a whole (2.9 percent), it implies a relatively greater pressure on resources on account of the much lower income levels in the Northeast. Fertility in the region appears to have declined slightly in recent years, although to a lesser extent than elsewhere in Brazil. Recent changes in official attitudes towards family planning are discernible and this may signal a greater scope for family planning activity in the future. Infant mortality rate is still, on the order of 150/1,000, and the overall mortality rate still relatively high. Thus, there is a great potential for reduction in mortality rates. The need for fertility declines is, therefore, greater in the Northeast if future population growth is not to exceed the national average.

16. Northeast population movements during the sixties have been characterized by sizeable migration to the South as well as by internal rural-urban migration. Despite relatively rapid economic growth in the region, about 1.7 million people left the Northeast during the 1960-70 period as against about 1.0 million in the previous decade. This implied a sharp increase in the migration rate.

1/ In 1950, the IBRD made a $15 million loan for the Paulo Afonso electric power project.

2/ Full treatment of the subject is given in Volume V, Annex I.

Table 5: ARTICLE 34/18 TAX CREDIT FUNDS FOR THE NORTHEAST

(In Cr$ millions at current prices)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Deposits of Tax Credit Resources In Bank of Northeast Brazil (BNB)										
Accruals	5.7	7.7	37.3	149.4	226.6	351.1	456.7	680.8	859.3	777.6
Disbursements	-	-0.3	-5.2	-6.7	-43.3	-178.7	-362.2	-490.0	-732.4	-854.2
Net Flow During Year	5.7	7.4	32.1	140.7	183.3	172.4	130.5	190.8	126.9	-76.6
(Year-End Deposit Balance)	(5.7)	(13.1)	(45.2)	(185.9)	(369.2)	(541.6)	(672.1)	(862.9)	(989.8)	(913.2)

Source: See Appendix Table 3.

Table 6: MIGRATION RATES /1
(percent)

1950	1.8
1960	4.6
1970	6.0

/1 Intercensal out-migration as percentage of total population in terminal census year.

Following the historical pattern, more than 60 percent of Northeast migrants have settled in the industrialized states of Sao Paulo and Guanabara. Significantly, the share of migrants going to the North and Minas Gerais has declined while the share going to the Center-West has increased sharply (to 20 percent), the latter most probably relating to the opening of the Belem-Brasilia highway.

17. In the 1960's, the urban population in the Northeast grew at about 4.7 percent per annum, of which about 1.8 percentage points were due to the migration out of the rural areas. As 2.5 million people moved from the countryside to the cities, rural population increased only by 1.3 percent per year.

18. Qualitative information on the migrants, both internal and external, is quite sparse. The most that can be said of them is that a majority are young (less than 30) and only very few are over 50. Of those who leave the rural areas most are women; women are more dispensable to the agricultural production process. Of those who leave the Northeast to take a long and uncertain journey to other regions in search of work, most are men. Sixty percent of the residual to be absorbed into the urban areas of the Northeast consists, therefore, of women who presumably very largely seek domestic service and relatively low paying tertiary sector activities. This is one reason why significant structural change within the Northeast, in terms of the share of labor being absorbed outside agriculture, may not bring very great changes in average incomes. These matters are taken up in later sections.

19. Much too little is known about the migration process and the people involved to be able to give more than a very generalized assessment of its impact on the development process. However, it is certainly true, that as major poles of industrialization have developed in the Northeast as well as elsewhere in Brazil, migration has transferred labor out of agriculture to facilitate this growth. Further, it seems clear that the migration out of the Northeast has considerably reduced the regional labor surplus and might also have raised the average incomes of those remaining in the region. This last effect will have been enhanced by any remittance flows back to the Northeast by migrant workers employed in other regions.

20. Migration, of course, has its costs. To the extent that the migration shifts the labor force from rural to urban areas, it imposes a cost in terms of the social overhead required for urbanization. To the extent that the increase in per worker productivity resulting from rural-urban migration

is less than this cost, such migration imposes a net burden on society. A recent estimate shows that the provision of urban amenities for a low income worker in the state of Guanabara costs society an amount equal to about 51 percent of the minimum wage. This raises the question of whether it would be better to redirect migration to areas where net costs -- additional social overhead minus increases in labor productivity -- could be minimized, e.g., to frontier areas in the Northeast itself (Maranhao) or in the North. The PIN and PROTERRA programs of the Government constitute a response to this option.

21. A second set of costs arising from the migration result from its effects on the labor force remaining in the Northeast. Because of the age-sex selectiveness of the outmigration, the average age of the domestic population has increased and dependency ratios have risen, more particularly in the rural areas. Both the male/female ratio and the labor force participation rate have fallen quite sharply. Since, also, it seems likely that those workers who migrate will tend to be of above average quality in terms of education and initiative, there is some resulting deterioration in the average quality of the remaining labor force. The fact that relatively high salaries are currently paid to attract better grade labor (technicians, supervisors, etc.) into enterprises in the Northeast is partly a reflection of this tendency.

22. Finally, there are the substantial private costs borne by the migrants and their families which are not requited by the market wage. Current government programs for the Northeast emphasizing rural development reflect a recognition of this fact. As yet, however, these programs have only a marginal impact on the migration flows.

D. Employment and Incomes

The Employment Problem

23. The employment problem in the Northeast is best characterized by the fact that about 70 percent of all money earners have monetary incomes less than the average legal minimum wage for the region ($320 per year in 1970). In the organized sectors, about half of the industrial workers and one-third of the service workers earn less than the minimum wage. Open unemployment rates are low, lower than in the South. The generally low rates of education and literacy simply preclude a high proportion of would-be work-seekers from formally entering the ranks of those waiting for or actively looking for work. Further, absolute poverty tends to force many labor force members to accept marginal income yielding activity rather than to pursue the search for productive employment.

24. There are various estimates of the size of underemployment in the Northeast. Based mostly on the number of work hours, the most optimistic estimate (National Household Survey) indicates a 1970 underemployment rate of about 19 percent for agriculture and 25 percent in the urban sector, giving an overall rate of 21 percent, as against 14 percent for Brazil as a whole. For the Northeast, this implies that about one million members of the 5.2 million

agricultural labor force and about 800,000 among the 3.2 million in nonagriculture are underemployed. Other estimates of underemployment in agriculture are available. Based on an income criterion, the SUDENE plan mentions a figure of 2.6 million workers, equalling about 50 percent of the agricultural labor force, as being underemployed in 1970. The underemployment backlog in the Northeast is likely to be anywhere between 1.8 million and 3.4 million. Between 1968 and 1970, the National Household Survey also shows a slight drop in both unemployment and underemployment. Too great a significance, however, should not be placed on these declines. They may simply be cyclical. More important is the structural change which is implied by intercensal shift of the labor force from agricultural to non-agricultural activities. As the agricultural labor force increased by only 0.4 percent per year during the sixties, its share of the region's total labor force sharply declined from 70 percent in 1960 to 62 percent in 1970. With steady increases in agricultural output over most of the decade, which are associated with increases in cultivated areas, underemployment in agriculture must have decreased.

25. During the last decade, the nonagricultural labor force increased by 3.6 percent annually. It cannot be assumed, however, that labor which transfers into the urban sector is automatically employed at such higher income levels than previously to qualify it as fully employed. Rural migrants have been attracted to the towns by the urban amenities, the chance of finding work at higher wages, and the difficulty of obtaining land or steady work in agriculture rather than by actual employment opportunity. The degree to which labor transfers into urban jobs results in substantial income gains will depend very much on whether these jobs are in the organized or unorganized urban sectors. There is no reliable information to show the extent to which urban sector employment growth involves the expansion of low as against relatively high income activities. There is some evidence, however, that new full employment opportunities have failed to keep pace with the growth of the urban labor force. Against an increase of one million in the urban labor force over the 1960-70 period, "organized" manufacturing employment increased by 40,000 (1.4 percent annual growth rate) mainly as a result of the significant industrial investment stimulated during the last five years by the 34/18 scheme, which more than offset a concomitant decline in textile employment. Moreover, due to the relatively recent origin of the 34/18 scheme, the secondary employment effects of industrialization (through supporting service industries, etc.) might not yet have had time to become evident by 1970. Nevertheless, the employment problem does appear to be a major development issue facing both the incentive scheme as well as regional policies.

Income Growth and Income Distribution

26. Mission estimates of the growth in regional product suggest that over the decade 1960-70 per capita GDP in the Northeast grew on average by 3.3 percent per annum, faster than Brazil as a whole, thanks to the impact of migration on population growth and to the fact that regional growth was as rapid as overall Brazilian growth during the period.

27. According to census figures, growth in real per capita monetary income, at 3 percent annually, was about as fast as growth in per capita regional GDP. During the decade, urban incomes seem to have increased much more rapidly than agriculture incomes, thus reflecting sectoral output growth differentials. Which income brackets benefitted most from rapid economic growth? Unfortunately, there is no information showing how the real incomes of the very poorest groups (the lowest decile) have grown during the period. Moreover, judgments as to changes in absolute income levels are made difficult by problems with deflating census income figures quoted in current cruzeiros by other technical difficulties. 1/ Nevertheless, the 1960 and 1970 censuses indicate that the real monetary incomes of the poorest 50 percent of the labor force increased by only about 1.6 percent annually over the decade. In 1970 the average income of this poorest 50 percent of the regional population was equivalent to US$132 to be shared with an average of 3.4 dependents. Thus, the monetary per capita income of the five lowest deciles was about US$40. If non-monetary income is added, total per capita income of the poor would probably be around US$50, as mentioned in several studies on the rural sector.

28. Incomes of the richest 10 percent, on the other hand, grew by 5.1 percent annually. Evidence also suggests that growth of income of the middle 40 percent (6th to 9th decile) was only at about 1.4 percent. These results, therefore, tend to confirm a broad correlation between income levels and income growth, at least for the two extremes of the distribution. Unfortunately, non-census data on incomes do not cover the entire decade and, therefore, are not comparable with intercensus results. Wage movements in recent years show varying trends. Real nonagricultural wage rates increased at an average annual rate of 3 percent since 1965 (Ministry of Labor data), while agricultural wage rates declined slightly during this same period (Vargas Foundation data). On the other hand, in a region such as the Northeast, where wage earners account for only about 25 percent of the agricultural labor force, agricultural wage data are hardly representative of incomes of the agricultural sector.

29. The no more than marginal improvement in the welfare of the poorer segments of the Northeast population is confirmed by the fact that the proportion of the labor force earning less than the real 1960 minimum wage (equal to US$435 equivalent) declined slightly from 86 percent in 1960 to 81 percent in 1970. There are also marked differences between sectors. As shown in the table below, progress was substantial in industry and marginal in agriculture. This accords closely with the estimates of relative income growth in rural versus urban areas, and with the general knowledge that the development of the sixties, i.e., since the inception of SUDENE, has heavily favored industrialization.

1/ Fuller treatment of data limitations, technical problems and their implications is given in Volume V, Annex I.

Table 7: ABSOLUTE INCOME LEVELS AND INCOME DISTRIBUTION IN NORTHEAST BRAZIL, 1960-70

	Average Income (1970 Cr$ per Month)		Annual	Share of Income %	
	1960	1970	% Increase	1960	1970
Poorest 50 percent	43	51	1.6	18.6	16.2
Middle 40 percent	126	144	1.4	43.2	36.7
Richest 10 percent	447	739	5.1	38.2	47.1
TOTAL	117	157	3.0	100.0	100.0
Gini Coefficient/1				.49	.56
Agricultural Sector	84	94	1.1		
Urban Sector	158	248	4.6		
Regional Minimum Wage	166	123			
% Labor Force Earning less than 1960 minimum wage	86	81			
(Agriculture)	(94)	(93)			
(Industry)	(82)	(69)			
(Services)	(68)	(62)			
% of Labor Force Earning less than 1970 Minimum Wage		70			

/1 Inequality index ranging from zero (most equal distribution) to one (most unequal distribution)

Source: C. Langoni: Distribuicao da Renda e Desenvolvimento Economico do Brasil, July 1972.

30. As in most Latin American countries, Northeast income distribution is very skewed. In 1970, the top 10 percent of the labor force received 47 percent of the income while the share of the poorest 50 percent was only 16 percent. The Northeast displays somewhat more inequality than the richer regions of Brazil. In addition, the 1960 and 1970 censuses indicate some reconcentration of Northeast income during the decade, as was the case for Brazil as a whole.

31. In recent months, there have been various attempts to explain the causes of income inequality and income reconcentration in Brazil as well as in

the Northeast. 1/ The conclusions of these studies are fully analyzed in the Main Report. With specific regard to the Northeast it should be noted that educational, sectoral, age and sex differences explain much of the observed income equality in 1970 and of the income reconcentration which took place over the last decade. Of these variables, education appears to be the most significant one.

32. In the Northeast, a rapid expansion of the labor force with training above the primary level was not accompanied by a comparable reduction in the number of workers without education. Thus, a more skewed distribution of educational attainments emerged by 1970.

Table 8: EDUCATIONAL ATTAINMENTS OF NORTHEAST LABOR FORCE

(In percentage)

	1960	1970
Illiterates	61.7	54.8
Primary School	34.2	36.9
Junior High School	2.3	3.9
Senior High School	1.1	3.0
Higher Education	0.7	1.4
	100.0	100.0

33. Variations in income growth between economic sectors is a significant determinant of the overall deterioration in equality during the period. The principal factor here, as already described above, is the widening of the income differential between agriculture and industry. Overall reconcentration was also significantly influenced by increased income inequality in the urban sector which was only partly offset by a slight improvement in income distribution in the rural sector.

34. The foregoing supports the hypothesis suggested by the preceding section: first, reduction of rural underemployment owing to the constancy of the rural labor force and growth in agricultural output, and second, reconcentration of urban incomes owing to the increasing share of profits in value added which seem to have accompanied 34/18 financed industrial development and to the limited number of jobs created by this development in the highwage industrial sector in contrast to the rapid pace of rural-urban migration.

1/ C. Langoni "Distribuicao de Rendas e Desenvolvimento Economico do Brasil", July 1972; A. Fishlow "Brazilian Size Distribution of Income" American Economic Review, May 1972.

35. Illustrative of the higher degree of income concentration in the Northeast is the fact that the richest 10 percent of its labor force get 47 percent of total money income (see table in para. 29 above) against an average 42 percent in the Center-South. Apparently, the stage of development in the region is such that institutional factors severely restrict access to education and to productive employment, sharply differentiating in an income sense a minority of the urban labor force from the majority of workers engaged in traditional pursuits in both urban and rural sectors, characterized by more or less homogeneous inputs and generally low productivity. By contrast, in the Center-South, personal characteristics can have more play and social mobility is greater. This is borne out by the fact that although the Northeast has a more equal distribution in agriculture than to most other regions, the distribution within the urban sector in the Northeast is more unequal than elsewhere. All this suggests that in devising programs to alleviate Northeast poverty one should not limit one's concern to the rural sector, but should take into account as well the pool of underemployed labor which has accumulated in the urban sector.

E. The Agricultural Sector

36. Agriculture was little emphasized by government regional development policies during the 1960's. The main bottlenecks to agricultural development -- highly skewed pattern of land tenure, lack of credit, extension and research facilities, marketing deficiencies -- remained, despite some improvement of programs for dealing with them. Agricultural activity continued to be bound to the traditional methods, sometimes extremely primitive, of rainfed agriculture and extensive stock raising. No appreciable gains in crop yields took place, although land under cultivation did increase far more rapidly than farm employment. There was a 4 percent per year increase in cultivated area in the Northeast as a whole, with rates of about 9 percent in the Maranhao and Piaui states. Increases in production corresponded to the increases in cultivated area.

37. With few exceptions, crop yields now run substantially below those obtained in the rest of Brazil. A major factor in the persistence of low yields is the low nutrient content and acidity of soils. Nevertheless, there is practically no use of fertilizer or lime on crops other than sugar cane. Uncertain and sparse rainfall is another limiting factor in some zones. The geography of the Northeast is dominated by a relatively dry, drought-prone area known as the Sertao, comprising over 50 percent of the total area of the Northeast but containing only 20 percent of the region's rural population. About 20 percent of the region's area is in Zona da Mata and Agreste, where rainfall is generally abundant and the rest is in the western border states of Maranhao and Piaui which have sufficient rainfall. But uncertainty as to the time of onset of the rainy season is a major problem even in the supposedly well-watered areas.

38. It has been shown that weather influences production techniques toward low-yield, low-risk choices. In many areas of the Northeast, moisture

constraints may seriously limit crop response to the use of fertilizers. Under conditions of water deficit, fertilized plots may yield less than unfertilized plots. The same applies to new seed varieties. Many of the specific causes of low crop yields and low livestock productivity have not yet been identified satisfactorily; much research is needed if adequate solutions are to be prescribed.

39. Agricultural development has been hampered by farm tenure patterns which have impeded the efficient use of land and have not facilitated the preservation of soil productivity or encouraged investment either by landowners or tenants.

40. The Northeast is characterized by high land concentration in the hands of the few. Slightly over one percent of the rural establishments have 35.7 percent of the area, while 45.2 percent have only 2.3 percent of the area. Eighty-one percent of the rural establishments of the Northeast are classified as minifundios, (not sufficient to maintain a family with 2.5 labor force members); such minifundios occupying 18.9 percent of the area. These statistics indicate the handicap under which the small farmers work. Their farms are so small they must try to squeeze every square meter into production year after year. They cannot allow any of it to lie fallow, and this can have only one result: a lowering of productivity unless there is a replenishment of the humus and minerals.

41. Only one-fourth of male agricultural workers are owner-operators. The remaining landless workers are share croppers, tenants, squatters or wage laborers. Sharecropper arrangements affect a large proportion of agricultural land. The relative bargaining power of the landlord is an important factor in the determination of the sharecropper's shares. In many areas the sharecropper is under obligation to sell his share either to the landlord or to a party designated by him. Resulting limits on freedom to make decisions as to when to sell have a decisive effect on the sharecropper's income. Tenancy arrangements apply mostly to large farms. Where a contract of tenancy is said to exist on a small farm, it generally differs little from sharecropping. Tenure is also linked to access to credit. Under Brazilian banking practice, real estate is the preferred collateral. Hence, tenant farmers wishing to borrow are at a disadvantage.

42. Land tenure affects not only the distribution of agricultural product but also resource allocation. Significant underutilization of land in large estates prevails throughout the Northeast. The major improvement which land redistribution could bring about is the incorporation into production of formerly unused land together with better labor utilization.

43. Large farms show a significantly higher land to labor ratio compared to small farms but lower value added per farm hectare. The usual explanation for the more intensive land use by small farms as compared to large farms assumes that large farm owners are not profit maximizers and they hold land for prestige and political reasons. A more plausible explanation, however, is to be found in the land and labor distribution and the response and market behavior that it provokes. Small family farms maximize the total output which in

turn is shared among the family members. In these circumstances, the wage rate is the average product which the family member receives and not the marginal product. The average yield, which is higher then the marginal product, sets the economic minimum below which wages will not fall in rural areas. Farm workers will not leave their own farms if the market wage will not give them a rate at least comparable to what they can earn on their own farms. Profit maximization by larger farms will, under these circumstances, lead to low land and labor use since they hire labor up to the point where its marginal product is equal to the going wage rate, equivalent to the average product (rather than the lower marginal product) prevailing on the small farms. This theory is confirmed by the established fact that labor on small owner-operated farms accepts in fact a shadow wage by working very long hours, much longer than as a hired laborer.

44. Available evidence 1/ shows that larger farm size is not accompanied by increasing returns. Under prevailing non-mechanized production practices, machine indivisibilities, which often yield large-farm economics, are not significant in the Northeast case. In the labor surplus context of the Northeast, these machines, in many cases, may not be socially profitable if capital and labor are shadow-priced. Even when they are profitable, these machines could in principle be supplied on a rental basis, so that their availability need not depend on farm size. Large size and efficiency are not synonymous, particularly in the case of absentee land ownership. The potentially greater efficiency of a more knowledgeable large-scale farmer appears to be counterbalanced by the small-scale farmer's more direct interest and more intensive use of land.

45. The foregoing suggests that a more equitable land distribution could increase agricultural productivity in the Northeast. It is true that static comparisons of efficiency do not take into account the problems which would be involved in moving the present situation to one of smaller family farms. The disruptive effects of land reform, such as lower investment and discontinuity of production, are not dealt with in the available literature. Having established the potential benefits of land reform, the policy maker must turn to an investigation of how reform can be accomplished in such a way as to minimize these disruptive effects of speculation, fear and uncertainty. It is in this sense that land redistribution by itself is not a sufficient condition to agricultural development.

Agricultural Credit

46. Despite the recent expansion of credit to Northeast agriculture, the regional distribution of credit is still an issue. It is estimated that, at present, the Northeast, which accounts for about 21 percent of national gross agricultural product, is receiving only 11 percent of total agricultural credit. Thus, while for Brazil as a whole, credit as a percentage of gross agricultural product was 37 percent in 1970; the corresponding figure for the Northeast was 19 percent.

1/ Cline, Economic Consequences of a Land Reform in Brazil, North-Holland, 1970.

47. Until recently most of the credit has been made available for operating expenses and marketing. There was a lack of long-term financing for capital improvements, which are basic to increased farm productivity in the cases where technology is proved out. Ranging from a low of 7 percent in the case of "modern input" financing to a high of 17 percent official agricultural credit interest rates were the same -- i.e., subsidized to the same extent -- as in the rest of the country. Then, following the 1970 drought, the National Monetary Council introduced a special line of agricultural investment credit as 7 percent interest which was later incorporated into PROTERRA (see para. 130).

48. The great majority of small- and medium-scale farmers are not reached by institutional credit sources. When they do receive credit, it is usually from expensive, non-official sources such as middlemen, merchants, brokers and landlords. In 1970 bank loans to Northeast agriculture numbered 133,000 as compared to a total of 2.2 million agricultural establishments (i.e., one credit for each 16.5 farmers). Although loans to cooperatives have increased, it is estimated that due to their weak management about 50 percent of the Northeast cooperatives do not receive bank credit. Of total bank credit made available to cooperatives in 1970, only about 9 percent went to cooperatives located in the Northeast. Even including cooperative credit, therefore, it is unlikely that more than one of every 15 agricultural establishments benefited from agricultural credit in 1970, against a national average of one of every four.

49. Brazilian bankers tend to emphasize constraints on the demand side in explaining problems of small-holder credit; i.e., the conservative nature of small farm operators, their unwillingness to change or assume debt risks, their lack of knowledge of how to use credit, the absence of profitable investment alternatives on their farms and their fear of dealing with formal credit agencies. However, the constraints on the supply side appear to be equally severe. The banks concentrate their funds in large loans to minimize average administration costs. They also try to minimize operational risks by lending mainly to those operators with high equity credit ratios. The fact that the banks are required to charge less interest on small than on larger loans is another incentive to make large loans. The access of the small farmer to institutional credit sources is further hampered by creditworthiness requirements such as land ownership, consent of the landlord, or reliable co-signers. Credit from the banks often involves delay and the completion of many formalities too complicated for the unsophisticated small farmers.

50. Across the board interest rate subsidization available to all users may have contributed in another way to credit concentration. Negative interest rates create excess demand and in the rationing process, funds will be mainly absorbed by those who are first into the credit market.

51. An analysis of the agricultural loan portfolio of the BNB, which supplies about one-third of total Northeast agricultural credit, suggests that not only has the distribution of agricultural credit not been improved, but there even may have been some reconcentration in recent years. From 1960 to 1967, BNB steadily increased the number of loans to agriculture as well as total value loaned. About 29,000 individual agricultural loans were

made in 1967. This number decreased very sharply, however, over the following four years and in 1971 only 12,000 loans were made. From 1967 to 1971 the BNB eliminated from its portofolio about 10,000 of its 19,000 clients who had borrowed sums less than 50 minimum salaries, the demarcation point for the above-mentioned interest differential. Some of the decrease in small borrower numbers was due to drought conditions and to some shifting of small borrowers to cooperative source of credit. At the same time, however, the BNB increased the number of agricultural loans in the 1,500 minimum salaries class more than threefold. These data strongly suggest that Brazil's recent credit policy has little positive impact on credit problems of small- to medium-sized farms.

52. Unfortunately, the agricultural credit program has not effected a meaningful change in the technology of Northeast agriculture. Usually, credit is used to finance traditional forms of agriculture rather than being used to finance other production inputs such as improved seeds, fertilizers, farm chemicals and storage. Only by combining production inputs and technical assistance can the credit program be maximized. (See Chapter V.)

Extension and Research

53. Regional disparities also prevail in extension and research expenditures. These expenditures have been expanded in the Northeast as in other parts of the country in recent years. In 1970, however, less than 700 field workers provided technical assistance to about 87,000 farmers or 4 percent of the total, against 10 percent for the rest of Brazil. Moreover, the percentage of individual agricultural credit operations accompanied by extension services was 3.7 percent in 1970, as against 5.1 percent for the rest of Brazil. 1/ In addition to the extremely low coverage, Northeast extension services suffer from weak linkage between research efforts and extension staff, as in the case for the country as a whole.

54. Again, the percentage of research expenditure to gross agricultural product is much lower in the Northeast than in the rest of Brazil. Moreover, inadequate institutional structure is a major weakness in the existing system. A multiplicity of experiment stations pursue uncoordinated programs which are inadequately funded. Parallel with this institutional problem, the selection of research projects has not responded to economic criteria. The system has tended to ignore problems requiring multidisciplinary approaches, particularly where economic and natural sciences should be interacting. Although the sensitivity of fertilizer use, as well as of a seed variety or farming practice to water, is an extremely important consideration for the Northeast, there has been little concern for this characteristic in the experiments. Finally, some of the existing experiment stations in the Northeast are located at sites where soils and other ecological features unduly restrict the geographic area within which research findings may be relevant. Also, large areas presenting distinctive

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1/ Excluding Sao Paulo where -- due to the state's own extension service the percentage was much higher.

environmental problems do not have stations located in them. The lack of integration with the extension service is another shortcoming of the present system.

Marketing and Prices

55. Deficiencies in the marketing system constitute one of the major factors inhibiting Northeast agricultural development. The agricultural sector is frequently subjected to gluts and shortages both geographically and over time, because of inadequate transportation facilities, lack of storage facilities and inefficient terminal markets.

56. Government price support activities in the Northeast have been far from commensurate with the region's importance in the nation's agriculture. Only 10 percent of the price support program's total outlays in 1971 were made in the Northeast. The main problems impeding the performance of the program in the region are: the lack of knowledge of the program on the part of producers and the fact that the middleman or the moneylender is the main beneficiary of the program rather than the small farmer who has to transfer to his creditor the possession of the crop prior to harvest. 1/

57. Input pricing is another major problem. Because of distributional bottlenecks, lack of feeder roads, etc., farmgate fertilizer prices in the interior of the Northeast are between two and five times higher than prices prevailing in the rest of Brazil, which, in turn, are as much as two times the international price.

F. The Northeast Industrialization Program

The Economics of the 34/18 Scheme

58. During the last decade, Northeast Brazil has experienced a spurt of industrialization in response to a system of incentives administered by SUDENE. SUDENE stressed from the start the major importance of encouraging rapid industrialization in order to increase the opportunities for nonfarm employment and to raise regional income levels. Another important objective of SUDENE's industrialization policy was diversification of manufacturing output in order to achieve a regional structure in the intermediate and capital goods fields which would approximate that of the rest of the country.

1/ This of course relates to the poor distribution of agricultural credit. If the small holder or sharecropper had access to such credit, he would be free to sell at the support price or higher. Dependent as he is, however, on non-official credit sources the small holder/sharecropper can be forced by such creditors to sell at lower prices.

59. The main instrument of the industrialization policy was a powerful incentive introduced in 1961 known as the 34/18 scheme. By depositing equivalent funds in the Bank of the Northeast (BNB), Brazilian corporations may offset up to 50 percent of their income tax liabilities each year. SUDENE uses a point system in determining the degree of priority of projects submitted for approval. SUDENE may authorize the release of these funds for financing projects undertaken by depositors, or by other private entrepreneurs up to a maximum of 75 percent of total equity capital involved. 1/ In cases where no loan financing is involved, therefore, the minimum required contribution from the investors' own resources would be 25 percent of total cost. Since the Bank of the Northeast may make a loan up to 50 percent of the total resources required for a SUDENE-approved project, the "own resources" required for SUDENE-approved projects may be as little as 12.5 percent of the total when loan financing is included. This powerful investment incentive is supplemented by several others conceded by the Federal Government, official banks and the Northeast states. These additional incentives include exemption from federal income taxes, and from state sales taxes (ICM) during the early years of the

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1/ Points are awarded according to plant location, essentiality, use of regional inputs, import substitution, broad-based ownership, labor absorption and labor participation in profits. Depending on priority as indicated by the points attributed to a project by SUDENE, 34/18 tax credits may be used up to 75 percent, 60 percent, 50 percent, 40 percent or 30 percent of the project's total non-loan financing.

project and access to official working capital finance. 1/ Finally, individuals are allowed to deduct up to 50% of their taxable income on condition that they invest it in registered shares of incorporated enterprises installed in the Northeast (so-called Art. 14 incentive).

60. The 34/18 scheme has created a capital market -- separated from the other capital markets in the country -- in which venture capital can be raised. But the access of new Northeast enterprises to 34/18 capital is not costless. In theory, cost is determined by the return on alternative projects in which 34/18 deposits may be invested. In practice, if the depositor is not the project sponsor, he usually receives nonvoting preferential shares, which are not transferable for five years and normally earn a nominal dividend rate of between 6 to 12 percent per annum. Added to this cost to the new enterprise in some cases is a brokerage fee for bringing the depositor together with the project sponsor. Until recently, the brokerage fee has been in the 5 to 8 percent range, generally shared equally by the depositor and the project sponsor.

1/ All new Northeast manufacturing firms are granted at least 50 percent income tax exemption for 10 years. If the firm pioneers a new product, the tax exemption is increased to 100 percent. In both cases, the exemption can be extended to 15 years for firms located in the poorer states. Approved projects are also eligible for loans from the BNB. Its terms, although still concessionary, have been hardening in recent years. Until the end of 1968, BNB loans were extended at nominal interest rates of 14 percent. In 1969 the interest rate was raised to 20 percent. In 1970, in connection with an IBRD loan, the system was changed to permit full ex-post monetary correction of loans of more than five years term and a maximum real interest rate of 8 percent. Most borrowers, however, chose to use loans of less than five years, on which monetary correction was not applied. Finally, in 1972 the BNB started applying monetary corrections on loans of more than one year term, following a nationwide rule imposed by the Monetary Council. The Northeast states have added a series of incentives. For five years after installation, firms can deposit up to 60 percent of their state value added tax (ICM) liability in a state development bank, from which these funds can be drawn as "own capital" for approved investment projects. State banks have also provided loan and equity financing, albeit to a limited extent due to their scarce resources. This, however, has enabled some investors to contribute as little as 6.25 percent of their own funds in 34/18 projects. Most states have set up industrial parks which provide a variety of services, such as access transportation, electrical substations, water supply, telecommunications, housing, schooling and commercial centers. The most famous is the Aratu Park, which accounts for about 40 percent of Bahia's industrial production. In Aratu, as of January 1972, 39 industrial plants were in production, 29 under construction, and 80 in various stages of study, financing, etc., with options for location in the park. Total investment in Cr$3 billion and the number of jobs created is 21,000. Other industrial parks have had varying degrees of success.

Since 1970, however, the demand for 34/18 funds has exceeded the supply and this brokerage fee has increased sharply. If the project sponsor is not well known he pays now as much as 30 percent to the broker who can put him in touch with a willing depositor. The system discriminates in favor of those large Brazilian firms whose own tax credits are sufficient to finance the installation of branches in the Northeast or who have the renown to be able to mobilize depositor capital readily. In these cases brokerage fees are eliminated or, at least, minimized.

61. Promotion of industrial development in underdeveloped regions, rather than countries, is hampered by the inapplicability of instruments -- such as tariff protection -- frequently used in national cases. Public funding of regional development banks, used elsewhere to stimulate regional development, probably also would have been insufficient to induce private enterprise to move into the Northeast. Brazil has found a way out of this dilemma as the 34/18 mechanism represents a rather ingenious way of channelling public funds into the underdeveloped region while having the decision about the use of the funds and the operation of the resulting enterprise wholly in private hands, except for the SUDENE approval. The 34/18 scheme has been effective during the last several years not only because it is so massive a device but also because it has been coupled with drastically improved federal tax enforcement. Once some investment was attracted the market gained dynamism and the system became self-propelling.

62. The 34/18 tax credit mechanism is a far more powerful instrument than the income tax exemptions. Income tax exemptions for new industries make a profitable venture more profitable; but they do nothing to reduce the loss to an enterprise in case the new venture turns out not to be profitable. The tax credit mechanism, on the other hand, by drastically reducing the amount of equity the entrepreneur has to supply for a given venture, automatically reduces the size of a prospective loss. If uncertainty about future costs and markets rather than the sheer absence of profitable investment opportunities is the principal obstacle to industrial investment, as it was in the Northeast, the 34/18 scheme is ideally designed to overcome the obstacle.

63. Moreover, the tax credit mechanism presents various advantages over tariff protection. Unlike tariff protection, the 34/18 system shows very clearly the cost of industrial promotion to policy makers and thereby insures a periodic reexamination of the continued need for paying these costs. In addition, the tariff protection equivalent even of the substantial capital subsidy constituted by the 34/18 scheme and associated tax exemptions is low, since the firm must still meet variable (labor and materials) costs which in most manufacturing operations exceed capital remuneration by a wide margin. Using a 2.0 capital-output ratio, which has been the average for SUDENE-approved projects through 1971, a 10-year average life of equipment, and further assuming that the average 44 percent contribution of 34/18 funds to firm's capital is free, the firm receives in effect a subsidy equivalent to effective protection of a moderate 15 percent. Thus, the combined effect of all the fiscal incentives is to permit Northeast firms to produce at a cost 15 percent higher than the Center-South firms and still be equally profitable.

64. In the context of the Northeast situation, however, it seems more appropriate to relate the amount of the subsidy to gross sales rather than to value added. Using the same example, the nominal protection (total subsidies/sales) afforded by the regional incentives is, in fact, a mere 6 percent, since inefficiencies (in relation to the Center-South) may be generated outside the firm (external diseconomies) as well as inside the firm (as reflected in the value added). This does not mean, however, that investment in the Northeast is not financially attractive. As the Table below shows, while protection is low, differential returns on capital are high. If the Northeast entrepreneur is as efficient as his counterpart in the Center-South, his return on equity may be as much as three times higher (47 percent against 14 percent in the example).

65. In this context, it is interesting to note that for the Northeast "average" firms the ICM exemption is probably more important than the 34/18 capital subsidy 1/ (which is expressed by the difference in interest payments in the Table on p. 27). The impact of ICM exemption in the finances of Northeast states is examined in Chapter IV-C below. The preliminary conclusion is that there is no great danger of serious misallocation of resources resulting from the 34/18 mechanism and the other regional incentives except in the case of highly capital intensive industries, where the import duty equivalent of the incentive package can be fairly high. For example, for an industry with a capital-output ratio of 5.0 the resulting nominal protection would be 11 percent and the effective protection as high as 24 percent. It should be added, however, that the highest average capital-output ratio by subsector for SUDENE-approved projects through 1971 has been 2.4 (metal industries). We have so far examined subsidies enjoyed by Northeast firms vis-a-vis other firms elsewhere in Brazil. Vis-a-vis the outside world, the existing tariff protection should be added. The combination of both will benefit particularly the established Center-South firms opening branches in the Northeast.

Capital Intensity

66. The 34/18 scheme has been criticized because, by increasing the availability of cheap capital to entrepreneurs, it favors capital-intensive rather than labor-intensive production techniques in a region with a heavy labor-surplus problem. 2/ Some analysts hold that when a method is sought that will activate investment decisions it is simply more efficient to subsidize capital rather than labor. Spending on capital pre-dates spending on labor and a subsidy of any given size is, therefore, far more effective in stimulating the investment decisions if it is applied wholly to capital than if it were spread in some fashion over both capital and labor costs. However, evidence suggests that despite the capital bias of the 34/18 system, the technologies of the firms that chose to become established in the Northeast are, by and large, comparable to those prevailing in the firms operating in the rest of the

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1/ As the impact of ICM exemption and of the 34/18 scheme is proportionate to value-added and to capital, respectively, their relative importance for a specific firm depends on the capital/output ratio of the firm.

2/ As to capital intensity, the ICM exemption, being based on value-added, is neutral.

Table 9: THE EFFECTS OF INCENTIVES TO NORTHEAST MANUFACTURER'S

	Northeast Firms	Center-South Firms	Subsidy
Total Investment Cost	1,000	1,000	
Financing: 1/			
34/18 Resources	(440)		6/
Own Resources	(310)	(500)	
Loans	(250)	(500)	
Gross Sales	1,200	1,200	
Tradeable Inputs	700	700	
Value Added	500	500	
(Depreciation) 2/	(100)	(100)	
(ICM) 3/	(35)	(75)	40
(Interest) 4/	(20)	(50)	30
(Labor and Other)	(175)	(175)	
(Gross Profits)	(170)	(100)	
(Income Tax) 5/	(25)	(30)	5
(Net Profits)	(145)	(70)	
Total Subsidies			75
Return on Equity (%)	46.8	14.0	
Effective Protection (%) (Total Subsidies/Value Added)	15.0		
Nominal Protection (%) (Total Subsidies/Sales)	6.2		

1/ For Northeast firms, average shares of 34/18 resources, sponsors' own resources and loans in SUDENE-approved projects in 1963-71; for Center-South firms the prevailing 1:1 debt/equity ratios as found by the 1972 Special Industrial Mission.

2/ Assuming a 10-year life of equipment.

3/ For Northeast firms, 17 percent rate on value-added and 60 percent exemption; for Center-South firms 15 percent rate.

4/ For Northeast firms, having easier access to official institutions (BNDE, BNB) 8 percent real interest rate; for Center-South firms 10 percent.

5/ For Northeast firms, 50 percent exemption on the 30 percent Federal corporate income tax.

6/ The extent of the 34/18 subsidy is shown on the "Interest" line below.

country. The average investment approved by SUDENE during 1967-70 was about US$16,000 per worker, 1/ somewhat higher than the corresponding US$13,000 for the whole country. Most of the difference, however, can be explained by (a) predominance of investment in new plants rather than in expansion of existing firms in the case of the 34/18 projects; (b) predominance among SUDENE-approved projects of local subsoil resource-based industries such as chemicals and metals, which are capital-intensive by nature; and (c) over-invoicing of investment costs by the project sponsors in order to reduce their own contribution.

67. Apparently, therefore, the impact of the 34/18 scheme on capital intensity has in practice been marginal, as the choice of techniques in the cases where there is any, is influenced by more important factors such as quality competition with the rest of Brazil and the world and limited availability of skilled manpower. Factor price distortions, as well as the adaptation of imported technology to the needs of a labor-rich economy seem to be national rather than regional problems.

68. In sectors like chemicals and metals that loom very large in Northeast industry the spectrum of techniques is very narrow. However, in the case of non-subsoil resource based activities, there is scope for improving manufacturing employment growth by directing investment to labor-intensive industry branches (e.g., garment industry, electronic components, watches, etc.). As the point system adopted by SUDENE for rating and approving investment projects is biased towards capital intensity, this opportunity has not been taken fully advantage of. The point system gives preference to capital and intermediate goods industries that are generally capital intensive. This duplicates criterion aims at developing a more balanced and relatively autonomous regional industry structure. Given the concern for the unemployment problems of the Northeast, high capital intensity is in itself undesirable, other things being equal. This is doubly so, if in fact such industries do not have a comparative advantage in the Northeast, and are profitable only given special preferences over other types of product.

69. On the other hand, the Northeast may not presently have a comparative advantage in labor-intensive products. It is wellknown that relatively low wages do not invariably mean low labor costs, since productivity may be relatively as low. Wages in the Northeast are around 40 percent lower than in the rest of Brazil but productivity differentials presently more than offset this differential. Wage/productivity comparisons can be made in terms of respective shares of wages in value added. If Brazil as a whole had an industrial structure similar to the one prevailing in the Northeast, the percentage of wages and salaries in Brazil's manufacturing value added would be

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1/ This is derived from the average project cost shown on Appendix Table less an estimated 15 percent for working capital. In the case of BNB-financed projects in 1969-71, the average capital cost per job was about US$12,000.

21.5 percent. 1/ Presently, wages amount to 23 percent of value added in the Northeast. 2/

70. With the development of industrial skills and infrastructure it can be expected that the manufacturing costs of some labor-intensive Northeast industries might fall below those elsewhere in Brazil and eventually elsewhere in the world. One thing which is needed is expansion and improvement of facilities for educating and training the labor force. Also, the SUDENE point system should be modified to give greater weight to job creation. The point system should, at least, aim to hold the degree of capital intensity over the region's industrial sector as a whole to that which would result in the absence of the 34/18 program.

The 34/18 Operation Through 1971

71. It is appropriate at this point to present a picture of the industrial projects which have been approved by SUDENE. Between 1963, when the 34/18 scheme started operating, and the end of 1971, about 800 projects with a total investment value of 1971 Cr$12.4 billion (corresponding to about US$2.3 billion) were approved. About 60 percent of the projects were approved during 1968-71 and, allowing for a 4-5 year average lag, most of them had not been completed by the end of 1971. The 20 largest projects, about 4 percent of the total, accounted for more than 30 percent of overall investment value. Slightly less than 70 percent of total investment value is accounted for by four industrial branches; chemical industries, 22 percent; metal industries, 19 percent; textiles, 13 percent; and, non-metallic minerals, 13 percent. Seventy percent of the investment was concentrated in intermediate goods, 25 percent in consumer goods and 5 percent in capital goods. Despite SUDENE's efforts to spread the benefits of industrialization throughout the Northeast, some 71 percent of approved investment value is located in three states: Bahia, 39 percent; Pernambuco, 23 percent; and, Ceara, 9 percent. The programmed composition of the total investment financing is shown, year by year, in Appendix Table 29. The 34/18 funds have played an increasingly important role in total project financing, averaging about 44 percent. Firms' own resources accounted for 31 percent (much higher than the theoretical minimum 12.5 percent under the SUDENE's point system), the remaining 12.5 percent corresponding to official bank loans and foreign loan financing.

1/ Calculated on the basis of the actual shares of wages in value added prevailing in Brazil's industrial sub-sectors in 1969 according to the IBGE's industrial sector survey of that year.

2/ This straight comparison could oversimplify the issue because it assumes the same capital intensity in the Northeast and elsewhere. Lower per worker productivity in the Northeast may be attributed to lower capital intensity in the region, despite the high cost of the new industrial jobs.

72. Before the starting of the 34/18 operations, Northeast industry was characterized by inefficient small units, rudimentary technological processes and low quality products. Lack of entrepreneurship, the small size of the regional market, lack of external economies, poor infrastructure and low labor productivity have traditionally hampered the growth of Northeast industry. High transport costs protected obsolete Northeast industry from Center-South competition.

73. The ingenious 34/18 scheme was highly successful in mobilizing and transferring resources to the region and in committing these resources to investment in manufacturing industry. Despite some failures, the region's economic base has been broadened, the industrial structure has been diversified and the whole region has been exposed to a modernization process. The subsidiaries of Southern firms have brought with them an inflow of experienced senior managerial staff that has already significantly improved Northeast entrepreneurship. Lack of local entrepreneurial capacity is the main cause of the failures that have occurred. The family nature of local enterprises is, however, gradually losing ground. As for infrastructure, the federal highway system has been greatly improved in length and quality, thus reducing sharply intra-regional and inter-regional transport costs. Transport costs no longer constitute either natural protection for or a barrier to the development of Northeast industry. 1/ Substantial progress also was made in power and telecommunications; electric generating capacity expanded 4.5 fold during the 1960's. It is in the field of interindustry relations that conditions in the Northeast still appear to be primitive due to the lack of subcontractors, component suppliers, maintenance units, etc. SUDENE and BNB could help small and medium industries in fully exploiting the linkages of the industrialization program. Another bottleneck facing Northeast industry is the shortage of skilled blue-collar workers (e.g., plumbers, electricians, sheet metal workers, toolmakers and repair mechanics) as well as of middle-level manpower in such areas as accounting and office management.

74. Higher production costs resulting from manpower and management shortages are compounded by the smaller scale of operations of most Northeast firms. Moreover, while there has been abundant loan and equity capital available to 34/18 firms, many of them have suffered from delays in project approval by SUDENE and, more recently, in capturing 34/18 funds. In order to cover the financial gap during project implementation, those firms have had recourse to short-term, high-cost financing, which in many cases, has impaired their financial viability.

75. Very little is known about the actual performance of firms that were established under the 34/18 system. Since very few of even the small proportion of projects already completed have had a full run-in period, there

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1/ Among the firms interviewed transport costs (on input, as well as on output) were below 3 percent of total production costs.

does not as yet exist an adequate empirical basis for such a judgment. This should be an area of further research in the future. IBRD analysis 1/ of the prospective profits anticipated by 487 new enterprises approved through the end of 1968 showed an average ratio of profits to total capital investment of 32 percent. A Brazilian study showing a 22 percent expected average internal rate of return on roughly 400 industrial investments approved by SUDENE during 1960-69 confirms the IBRD finding of high prospective profit rates. 2/ Although most of this investment is being made by firms already established elsewhere in Brazil and experienced in their lines, and consequently competent to estimate costs and sales, it is likely that difficulties in providing skilled manpower and in capturing 34/18 funds must have prolonged the period required for the new plants to achieve the efficiency levels implicit in their profit projections.

76. SUDENE-approved industrial projects have been characterized by high abandonment rates, reflecting the difficulty of obtaining good information with which to pre-evaluate their feasibility. An idea of the Northeast firms' financial performance can be derived from an analysis of BNB's industrial loan portfolio. As of April 1972, 24 percent of total loan portfolio was in arrears more than 3 months or had been rescheduled recently. But only 19 percent of the portfolio was in companies whose prospects were regarded by IBRD supervision mission to BNB as being uncertain or poor. Poor management was the main cause of the firms' financial difficulties. Inadequate accounting, delays in project completion owing to technical problems or difficulties in obtaining 34/18 resources, marketing problems, as well as delays in raw materials supply for new products were frequently mentioned as factors adversely affecting firms' profitability.

77. Finally, a survey conducted in 1970 by SUDENE among 154 projects completed by the end of 1968 showed:

(a) sixty percent of the firms were operating at full capacity; 22 percent at 70 to 99 percent of capacity, and the remaining 18 percent at below 70 percent of capacity.

(b) About 50 percent of the firms working below full capacity attributed it to lack of working capital, 21 percent to raw material problems, 14 percent to demand constraints and another 14 percent to manpower and marketing problems.

(c) The actual labor absorption was 90 percent of the forecast and average capital cost per job was around $12,000.

1/ Appraisal of Banco do Nordeste do Brasil, DB-52 (1969).

2/ E. L. Bacha et al. "Analise Governamental de Projetos de Investmento no Brasil", IPEA, 1971.

(d) The Northeast market accounted for 60 percent of the sales, against 35 percent the Center-South and 5 percent exports.

(e) Despite generous tax exemptions, federal and local taxes paid by new firms in one year equalled about 30 percent of the 34/18 financing.

78. What emerges from the SUDENE survey is that there is some excess capacity among the newly established Northeast industrial firms. It is hard to believe, however, that the main cause of it is lack of working capital. Although credit shortage prevailed during the stabilization years (1964-67), short-term credit availability was adequate by 1970, at the time of the survey. The fact that the firm was still in the run-in period, in some cases, or insufficient planning, which led to some overinvestment, in other cases, probably were factors more important than the alleged lack of working capital to explain why the firm was operating below full capacity.

79. Another interesting finding of the survey relates to marketing patterns. It has been frequently alleged that the Northeast market is inadequate even for subsidized industries and that these can exist only by selling their products to the rest of Brazil. The data with respect to actual markets clearly refute the charges made. Further, another survey 1/ indicates that the new firms are expected to have close linkage to the region, which will provide most of their material inputs as well as their principal market. Fears that the program will generate a great deal of uneconomic transportation to and from the Northeast would appear, therefore, to be unwarranted.

C. The Transport Sector

80. During the 1960's some of the major transport bottlenecks that were impeding Northeast development were eliminated. The federal highway system was substantially improved in length and quality and there is at present no major bottleneck to interregional flows. Between 1960 and 1970 the length of paved highways increased fourfold, thus reducing sharply inter-regional transport costs. By 1975 when the present construction program is completed, very few federal highways presenting any economic interest will remain unpaved. What remains to be done now is to complement the primary system with an improved rural roads system in areas that have been neglected thus far and that have an important agricultural potential. Preliminary evidence suggests that in these areas the high costs of moving products from the farmgate to primary assembly points are responsible for a large share of high marketing margins. The same applies to farmgate price of agricultural inputs. BNDE, with the financial support of USAID in the form of a US$25 million loan, is engaged in the financing of a US$80 million nationwide program of feeder road construction. Although this program is especially directed to the Northeast and Center-West states it is understood that the present resources will

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1/ 1969 IBRD Appraisal Report.

be far from sufficient to cover all Northeast needs (see Chapter V). Construction and maintenance of feeder roads should be handled at the state level, either by the state highway departments (DER's) or by semi-public corporations (consorcios rodoviarios), such as those already operating in several Northeast states. In addition to extending and strengthening these local operational enterprises, there is a need for a national or at least a regional intersectoral committee to formulate, coordinate and control a transport program to meet the developmental objectives of the Government in the Northeast. SUDENE, as the main development agency in the Northeast, could play this role if it received strong support of and collaboration from both the National Highway Department (DNER) -- which should get more involved in this domain than it presently is -- and BNDE (Banco Nacional de Desenvolvimento Economico).

81. The Northeast cities of Recife, Salvador and Fortaleza are experiencing urban transportation problems. These problems have largely to do with existing ports in the oldest parts of these cities and with the lack of bypass for thru traffic. To remedy this, peripheral highways are being built (Recife) or studied (Fortaleza). Recife and Salvador are also in the process of developing Urban Transport Master Plans.

82. The Northeast railway network was designed primarily to reach isolated inland cities. The geographical layout of the network, as well as the very poor condition of alignment and roadbeds and the obsolescence of rolling stock explain much of the inefficiency of the Northeast and railway network, especially on long-distance hauls. The 1969 Brazil Transport Survey recommended the closure of part of the Northeast railway system, which was uneconomic.

83 For social and national security reasons, the full program of line closure recommended by the Transport Survey has not been strictly implemented; in fact, a new line was opened to traffic in 1972. The regional railroad system is incurring heavy deficits; its operating ratio current expenditures/current revenues is about 4. Given the present network size and rates, traffic on the NE system remains much too low to ensure the economic and financial viability of its operation. No changes are expected in the near future that could modify the present picture: (i) prospective traffic increases are not important; (ii) rates cannot be revised upward since the railroad would then certainly lose traffic to the roads; (iii) the remaining lines to be abandoned under the current RFFSA program are few compared to the total network; and (iv) planned personnel reductions are marginal. If the Government is not prepared to close down the uneconomic lines presently under operation, then the Transport Survey's recommendation concerning "normalization" should at least be followed more strictly. This would require that the part of the railway deficit attributable to maintenance of uneconomic lines for national security and social reasons be clearly and precisely identified and that adequate compensating transfer be made to the railway by the Federal Government.

84. In the Northeast, shipping, both coastwise and deep-sea, no longer holds the privileged position it used to have when there was no highway competition and all goods transitted the ports. Although half of Brazil's ports

are located in the North and Northeast, they handle only 18 percent of the total traffic and 7 percent of the international traffic. Most of the ports are small, with poor natural conditions, and they have obsolete equipment and organization. A modernization effort is underway consisting of: (i) building specialized terminals (for sugar in Recife, for salt in Areia Branca, for oil products in Salvador); (ii) constructing new port facilities or extending the old ones (the new port of Itaqui, to replace Sao Luis; the improvement of Recife); (iii) creating mixed economy companies to replace the rigid, over-centralized administration of the National Ports and Navigable Waterways Department (DNPVN) management (Sao Luis/Itaqui, Belem, Mucuripe).

85. Any further important new infrastructure investments should await the results of ongoing and future studies. The modernization effort which the Government has addressed itself to should deal more urgently with the specific problems of general cargo. Contrary to liquid bulk traffic (petroleum and oil products) and dry bulks (salt, grain, sugar), general cargo traffic is declining steadily as a result of the truck competition, especially on the North-to-South hauls. This decline will continue unless mthe competitiveness of coastwise navigation on long hauls is restored by means of its integration in an intermodal transport system. Conditions for this rehabilitation include:

(a) fostering the development of joint truck-cabotage companies, offering door-to-door services;

(b) granting shippers more freedom in the use of port accomodations and easing from them the burden of DNPVN port regulations;

(c) increasing the reliability and speed of coastwise transport; and,

(d) enforcing the regulation of sailing schedules.

H. Social Sectors

Health

86. The health picture in the Northeast has been improving in the last decade, although not at the speed required to cope with absolute needs and regional disparities. Despite the persistence of communicable diseases and the lack of basic sanitation, there has been a reduction in general and infant mortality rates, but the latter is still at 150 per thousand; high enough to stimulate high fertility and thus to be an important bottleneck to the achievement of a more stable rate of population growth at lower fertility and mortality rates. While the number of hospital beds has increased proportionally faster in the Northeast than elsewhere in Brazil, this increase has not been accompanied by a similar increase in the number of doctors. This points to one of the region's main health problems, the underutilization of existing facilities.

87. Although some improvement occurred in recent years, malnutrition is one of the region's most pressing problems. It largely accounts for high pre-school mortality rates. BNB studies indicate that calorie deficiency over the whole Northeast population averages 25 percent per capita. The poorest one-third of the population suffers a calorie deficiency of more than 50 percent.

88. Water and sewerage services are still very inadequate, thus constituting a principal cause of disease and disability. Significant progress however, has been made in water supply. The share of urban population supplied with water increased from 19 percent in 1960 to 30 percent in 1970. (The latter compares with 50 percent for all Brazil.) The BNB is presently financing a water supply program which, if implemented according to schedule, should meet 60 percent of the Northeast's urban requirements by 1980. One problem that the program may encounter is the unavailability of state counterpart funds. This issue is further discussed in Chapter IV. The proportion of the urban population served by sewerage facilities is not only very low -- about 7 percent, as against 26 percent for all Brazil -- but has been decreasing in recent years owing to the rapid growth of the cities. In the two main centers of the Northeast, Recife and Fortaleza, 25 percent of the population live in favelas. Water and sewerage availability is much scarcer in rural areas. There, only 0.6 percent of the population is supplied with water (against 2.4 percent for Brazil as a whole) and mere 0.2 percent is served by sewerage system against 0.5 percent for Brazil. This also reflects the priority that in the allocation of scarce resources urban communities receive since they confront much larger and more difficult problems.

Education [1/]

89. Quantitatively, the education and training system of the Northeast has responded impressively to the growing national commitment to education. Between 1964 and 1970 enrollments in the formal education system increased at an average annual rate of 5.1 percent at the primary level (grades 1-4), 12.9 percent at the ginasio level (grades 5-8), 15.7 percent at the colegio level (grades 9-11), and 18.3 percent at the higher level. The primary and colegio enrollment growth rates surpassed those for Brazil as a whole. Vocational apprenticeship training provided in the Northeast by the national associations of industry and commerce (SENAI and SENAC) also increased substantially. In addition, in its first year, Brazil's national literacy campaign (MOBRAL) involved 75 percent of the Northeast's municipalities in programs of adult education. By mid-1971 the Northeast accounted for 360,000 or 42 percent of the adults successfully made literate by MOBRAL.

90. Despite these gains, however, there remain significant regional disparities regarding the distribution of education opportunities and attainments as well as the efficiency and quality of the education system. Enrollment ratios for the relevant age groups in the Northeast are lower than for

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1/ Full treatment of the subject is given in Volume V, Annex II.

Brazil as a whole at all levels of education, amounting to only 45-50 percent of the primary age groups versus almost 70 percent for all Brazil. With slightly less than one-third of Brazil's population, the Northeast accounts for about one-half of the country's 15 million illiterates over 14 years of age.

91. A comparison of education efficiency shows that 81 percent of primary school students drop out before completing grade four in the Northeast, compared to 64 percent for all Brazil. Due to wastage in the system caused by repeaters and dropouts, it takes eleven school years to graduate one student from four years of primary school in the Northeast, compared to eight years for Brazil at large.

92. Secondary level education dropout rates are much lower than for the primary level but still show a similar disparity between the Northeast and all Brazil. A selective examination imposed on students moving from the primary to the secondary level has contributed to lower dropout rates in secondary schools. About one-half of primary graduates continue to secondary school in the Northeast.

93. Comparisons between the Northeast and all Brazil should not obscure the disparities within the Northeast itself between urban and rural areas. Enrollment ratios, literacy and labor force education attainments, and (in most Northeast states) education efficiencies are all lower in the rural areas than in the urban areas of the Northeast. In terms of these indicators, the rural areas of the Northeast also compare unfavorably in most instances with rural areas in Brazil as a whole.

94. Contributing to the low efficiency of the Northeast's education system is the fact that at least one-half of primary and secondary school teachers are unqualified. Most teachers are part-time and may hold another job or teach in several schools. Another contributing factor is the lack of sufficient physical facilities (70 percent of primary schools have a single classroom) to keep students in school for more than a few hours each day. Most primary and secondary schools operate on a triple-shift basis. In addition the curriculum at both levels is crowded and difficult and textbooks are rare. Socio-economic factors, such as seasonal agricultural work and distance to school in the rural areas, also undoubtedly contribute to the system's inefficiency.

95. Manpower data required to evaluate the response of the formal education system to the needs of the economy is lacking, although a main criticism of the present system is that it is too theoretically and academically oriented and thus limits the adaptability of graduates and dropouts to job tasks in the labor force. Academic and university oriented streams accounted for approximately 80 percent of secondary school enrollments in 1970. The percentage of total enrollments in the industrial and commercial streams declined slightly during the 1960's (amounting to 12 percent of ginasio and 23 percent of colegio enrollments in 1970). Enrollments in

agricultural streams account for less than one percent of enrollments. There has been no regional education development strategy to parallel the Government's regional development projects and plans.

96. Between 1964 and 1970 total public education expenditures in the Northeast increased at an average annual rate of 15.5 percent, with education expenditures at all levels of government making substantial gains. The growth in expenditures was not enough, however, to improve the Northeast's share of total Brazilian public education expenditures. With more than 20 percent of Brazil's enrollments, the Northeast in 1970 accounted for only 14 percent of total national public education expenditures, the same share it accounted for in 1964. Interregional differentials in per student expenditure may be explained by lower teacher salaries in the Northeast, (which is, in turn, reflected in lower productivity) and by a smaller teacher/student ratio prevailing in the region together with very limited educational materials.

97. Recent trends show that the states have been committing to education an increasing share of their budgetary resources and that reliance on these resources has grown in comparison to that on transfers from the Ministry of Education. An average of 92 percent of the states' budgetary resources devoted to education, as well as a considerable portion of federal transfers for education, go to meet recurring costs, mainly salaries. With the present limited availability of funds the states cannot afford to devote any significant amount of their own resources to capital investments in education.

98. Federal and state authorities are well aware of the deficiencies in the education system. Recent reforms enacted by the Government are intended to:

(i) change the structure of the education system by combining the primary and ginasio levels into an eight-year course of basic education;

(ii) expand education opportunities at this new level to include 90 percent of all 7-14 year olds by 1975, while reducing the incidence of repeaters and dropouts through improved efficiency;

(iii) end premature specialization by providing exploratory pre-vocational courses only during the last two years of the eight-year basic cycle; and

(iv) orient curricula and enrollments at the colegio level to job opportunities, providing adequate professional training to students who will not continue to higher education.

99. The implementation of these reforms rests with the individual states. Consequently, the reforms' success will depend largely upon the states' physical and financial constraints. Federal assistance will be channelled through the Education Salary Tax, an earmarked transfer mechanism,

and several Northeast states will receive additional assistance from USAID through a nationwide US$50 million loan as well as from other external sources. No cost estimates for the reforms have yet been derived; these are to be determined on the basis of results of a school mapping and inventory of existing facilities now being conducted by the states as part of an evaluation of their education systems.

100. There is a clear need to strengthen state education planning units and to relate planning at the federal level to state and regional disparities and priorities. National education objectives may not be consistent with state and regional development needs, and national enrollment targets have little meaning for states with below-average enrollment ratios, such as those in the Northeast.

101. If the Northeast states were not to increase the present share of their budgetary expenditures devoted to the current costs of primary education and the growth of primary school enrollment were to continue at the rate achieved between 1964 and 1970, the mission estimates that by 1975 the operating costs of the system would greatly exceed the availability of budgeted resources. In addition, larger expenditures at the secondary level will be required simply by virtue of the larger flow of students admitted from the primary level. The combined impact of current and capital expenditure for primary and secondary education on state finances is further discussed in Chapter IV. It suffices to note here that the strain on state financial resources resulting from the past rapid expansion of the education system suggests that the Federal Government should give serious consideration to increasing the share of its resources which it transfers to the states to cover education expenditures.

102. The rapid growth of secondary and higher education enrollments has reduced the shortage of middle level and professional manpower, although the situation is still critical in some areas. A faster and more efficient response to increasing manpower requirements is, therefore, necessary. Because of the overwhelming attention devoted to the new basic education cycle, upper-level secondary education appears to be neglected by state strategy. As long as migration continues to be an important solution to the Northeast employment problem, resource allocations to the education sector should be responsive to prevailing migratory patterns, and the mechanisms of compensatory fund transfers for education should often be reviewed to reflect these patterns. Current federal resource allocations for basic and secondary education are based on criteria that favor slightly the poorer states, but they do not take into account the benefits that the richer states receive from the inflow of manpower that may have been educated at the expense of the poorer states.

III. THE NEW NORTHEAST DEVELOPMENT STRATEGY

103. As in 1958, the 1970 drought jolted the Government into a major reformation of its policy towards the Northeast. The vulnerability of the Northeast economy was displayed by the drought. The limited role of industry in absorbing surplus labor was recognized. It was decided that the main solution to agricultural underemployment and poverty must lie within agriculture itself. Two new dimensions were added to Government policy: labor mobility and agriculture. With the creation of the National Integration Program (PIN) in 1970 and the Program of North/Northeast Land Redistribution and Agricultural Development (PROTERRA) in 1971, 50 percent of the 34/18 income tax credit resources, corresponding to about US$280 million annually, were preempted and channelled to finance agricultural development and related infrastructure in the Northeast and Amazon regions through 1976. Another major component of the new regional development strategy is a program to reorganize the inefficient Northeast sugar industry. Together, these new programs constitute a major attempt to ease the agricultural underemployment in the Northeast, partly by removing workers from this area to new agricultural frontiers and partly by increasing the productivity of workers remaining in the area.

A. The National Integration Program

104. In 1970, the Government created the National Integration Program which is preempting 30 percent of the investment tax credit resources and applying them in (a) construction of the Transamazonica and Cuiaba-Santarem highways; (b) colonization of areas adjacent to these roads; and (c) construction of various irrigation works in the Northeast. The 1971-74 budget for the three schemes is as follows:

Table 10: 1971-74 PIN EXPENDITURES

(In Cr$ millions at constant 1971 values)

	Actual	Projection			Total	
	1971	1972	1973	1974	Value	% Distribution
Total	518.7	690.0	757.5	831.0	2,797.2	100.0
Transamazonica and Cuiba-Santarem Highways	363.0	213.0	280.0	350.0	1,206.0	48.2
Colonization Program Along Transamazonica and Cuiaba-Santarem Highways	30.0	175.0	175.0	175.0	555.0	26.9
Irrigation Programs for Northeast	71.9	227.0	227.0	227.0	752.9	26.9
DENOCS - Irrigation	(71.9)	(82.0)	(82.0)	(82.0)	(317.9)	
Transfers to PROTERRA - Irrigation	(-)	(65.0)	(65.0)	(65.0)	(195.0)	
Transfers to PROVALE - Irrigation	(-)	(80.0)	(80.0)	(80.0)	(240.0)	
Other Projects/1	53.8	75.0	75.5	79.0	283.3	10.1

/1 Includes -- inter alia -- aerial mapping and surveying project and the construction of river wharves.

Sources: Ministry of Planning; and IBRD mission projections.

105. The construction of the Amazon highways is much more advanced than the other two components of the PIN. Between 1972 and 1974, the Government will invest over US$200 million for transport infrastructure in the Amazon region, a figure 50 percent higher than the original estimate as a consequence of the unexpected amount of earth movement and drainage works required.

106. The Government balanced the national security and political objectives of the Amazon roads against the Northeast underemployment problem. Had the second objective been preponderant, the nature and the phasing of the program would have been different: more time for planning and surveying, construction periods spaced out, priority given to the more easily accessible pre-Amazonian region in Maranhao and Para. A 1,000 km penetration road such as the Maraba-Altamira first section of the Transamazonica highway can be economically justified as a component of a colonization scheme. A 5,000 km construction program in areas where the ecological and agricultural environment in unknown, is more difficult to defend on economic grounds. Moreover, highway investment

does not seem to be a necessary condition for prospecting and exploiting mineral resources in the Amazon region. Prospecting can be achieved as in the case of the Carajas iron ore deposits without help of road access to the site and, for most minerals, highway transport would be too expensive to be considered. The high transport costs resulting from the location of Amazon subsoil resources are a major deterrent to their exploitation and only large-scale production can offset these costs.

107. The two Amazonian highways -- the Transamazonica and the Cuiaba-Santarem -- apparently are eventually to be part of a larger network which would provide all weather road access to Brazil's northern and western borders. The National Highway Department (DNER) has undertaken preliminary studies of the construction of the Perimetral Norte, a 4,400 km long peripheral highway which will run along the northern and western borders of the State of Amazonas, touching Brazil's boundaries with the Guyanas, Venezuela, Colombia and Peru. The timing of construction as well as the source of financing have not as yet been decided. It is hoped that any action will be deferred until there is more evidence of the economic justification of this massive additional road project.

108. Government colonization schemes along the new Amazon highways are proceeding at a much slower pace than originally forecast. Against a target of 100,000 families settled by 1974, 1,200 families were settled in 1971 and 3,000 are expected to be settled in 1972. Settlement policy in the Amazon region is still in the process of definition. As a planning basis for such projects, Brazilian authorities are gradually shifting from the ad hoc system which simply allocated fixed areas of land for settlement to a system which has as its basic objective the achievement of resettled family income targets.

109. A number of different methods of promoting settlement are being used. Over the past few years there has been a great deal of spontaneous settlement following the opening of new roads, notably along the Belem-Brasilia highway. As settlers acquired no legal tenure rights and were not assisted either financially or technically by the Government these settlements have been characterized by rapidly declining yields and eventual abandonment of the land, or its transformation into low-yielding grazing areas. Along the new Amazon highway, the Government has introduced limits on spontaneous settlement, although it will be difficult to enforce them fully once road access has been provided. Also, the Government has started to establish a controlled settlement near Altamira in the State of Para. Each settler is given about 50 hectares of cultivable land and the Government provides housing and amenities in well-planned residential areas. Besides being expensive (over US$10,000 per settler), settlements of this type receive a high degree of administrative supervision and rely heavily for their economic viability upon the settlers' capacity to achieve high-value cropping patterns.

110. The Government has undertaken to design and experiment with other settlement models. At one time the Government stated that it was its aim to settle 700,000 families in the Amazon region over the next twenty years.

If this target is to be approached, costs both in terms of finance and of the Government's limited administrative capacity will have to be kept as low as possible.

111. One such alternative model is that selected in the IBRD-financed Alto Turi project in Maranhao at a per settler cost of only US$1,700 and an annual family income target of US$600 plus subsistence. This represents a practical, low-cost approach to the problem, somewhere between the highly administered scheme mentioned above and undirected spontaneous settlement. The pattern worked out for the Alto Turi project is also the starting point for the preparation of a new project in the Amazon, upon which the Government and IBRD/FAO cooperative program personnel are now working.

112. Although officially financed and administered settlement will be crucially important in promoting general settlement and also in improving the Government's knowledge of new and unexplored regions, it is likely that occupation of the lands opened up by the Amazon roads will be predominantly of the spontaneous type. However, spontaneous settlement need not be uncontrolled. the Government can impart order to it by accompanying it with a system of land titling and with other externalities such as feeder roads, production and market research and related extension services. Not only is uncontrolled settlement unlikely to achieve reasonable resettled family income targets -- in the end it probably would perpetuate the economic dualism presently prevailing in Northeast agriculture -- but it could also seriously damage the ecology of the Amazon region.

113. In this context, the results of a recent IPEA study on colonization 1/ are noteworthy. Past experience with official colonization in Brazil shows that unsuccessful settlements were characterized by: (a) absence of secure land tenure; (b) prevalence of subsistance crops and (c) lack of marketing organization. Cost per family settled shows wide variation for both successful and unsuccessful settlements.

114. Another issue in colonization policy is the relative desirability of the various frontier regions and their settlement over time. In considering alternative frontier areas, the Central West and the frontier Northeast states still appear to offer the best colonization alternative at present. As compared to the Amazon, these regions are close to markets and have land quality which is proven to be agriculturally productive. The potential of the Central West region in particular is appreciated by the Brazilians as shown by the recent promulgation of PRODOESTE. 2/ There are also several existing

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1/ V. P. Tavares et al. "Colonizacao Dirigida no Brasil".

2/ PRODOESTE is a Cr$650 million three-year investment program covering the southern part of Mato Grosso, Goias and the Federal District. It includes construction of (a) basic road network (Cr$460 million) and feeder road system (Cr$50 million); (b) storage facilities (Cr$90 million); (c) water supply and sewerage facilities (Cr$50 million).

colonization schemes in the Northeast that might be rehabilitated. Many of these have good proximity to markets, a distinct advantage over more remote settlement.

115. Regardless of what mix of colonization techniques eventually emerges and where they are applied, the greatest need appears to be for the Government to prepare itself now for making adequate titling arrangements and for orienting settlers in terms of the commodity mix of output and the techniques applied in its production.

116. The PIN originally contemplated irrigation of 40,000 hectares by 1974. However, the irrigation funds allocated under PIN through 1972 correspond to only about 50 percent of the amount needed to reach that goal. In addition to project delays, it appears that the Brazilian Government wants to proceed cautiously in this field by implementing only clearly viable projects in the next few years.

117. The discussion Chapter II, E on Northeast agriculture emphasizes the need for techniques enabling Northeastern farmers in the semi-arid parts of the region to make the best use of available rainfall. The direct approach for solving the water problem, of course, is by irrigation. The Northeast has been building dams for nearly a century, originally and primarily as a means of storing water in order to cope with recurrent droughts. Until the 1960's the irrigation potential of these works was little exploited. Irrigation that was installed was poorly managed, so that soils became waterlogged or saltladen. Recently the Government began to design and implement larger irrigation projects with greater attention to proper exploitation of water resources.

118. The Executive Group for Irrigation and Agricultural Development (GEIDA) was established in 1968 to coordinate national policy and programs for irrigation. GEIDA has identified 56 projects in the Northeast with economic rates of return of at least 10 percent assuming forecast production can be marketed. These projects, with a total area of about 200,000 hectares (more than twice the area presently under irrigation) tend to be large government schemes rather than plans for small-scale private irrigation activities (such as multi-pump and sprinkler systems). The schemes generally involve a family farm colonization structure with 5 hectares per family, although planners appear to be considering private large farm structures as well.

119. Many of the projects involve the use of water already in reservoirs, constructed in the past in anti-drought programs which gave little attention to irrigation use. Despite the resulting avoidance of new dam construction in most cases, the projects would be costly. In some instances, the terrain is hilly and long conduction canals are required to reach the flat cultivable areas. In others, the lands to be irrigated require drainage; elsewhere, high pumping from rivers is necessary. The average investment cost of the projects reaches US$2,800 per hectare (or US$1,700 excluding buildings, farm machinery and workers' houses), a very high level by international standards.

120. The projects are capital intensive. They would employ 0.59 workers per irrigated hectare, giving a capital/labor ratio of US$4,800, more than seven times the average capital/labor ratio in Brazilian agriculture.

121. High value per hectare crops are required for the projects to pay their heavy investment costs, and yet these crops are "luxury" goods with limited markets. The level of output of such crops (e.g., tomatoes, grapes, melons and pineapples) required to make these irrigation schemes economically viable appears to be grossly out of proportion to Brazil's domestic and export markets.

122. Their high capital intensity means the projects would contribute very little to labor absorption. Even if the full area of 200,000 hectares were implemented, only 155,000 permanent jobs would be created directly. This level represents approximately 2 percent of the rural Northeastern labor force, and would not be fully reached until completed project installation in 1980. Despite the small impact on Northeastern employment, the projects would require the very sizeable sum of US$548 million in investment.

123. Thus, the fact that the Government is proceeding much more slowly with the GEIDA irrigation program than called for originally by the PIN seems entirely justified. On the other hand, it is to be hoped that the funds liberated thereby will be channelled into development of dry land agriculture in the Northeast rather than to the expansion of an already ambitious Amazon road program. Moreover, for those irrigation projects which are undertaken, it is to be hoped that the degree of labor intensity implied by their originally anticipated small farm structure be retained. There appears to be some possibility that after public construction of the irrigation works, the project areas would be sold to large firms for agricultural production, to avoid the institutional burdens of extension and organization required for a small farm structure. Such a revision would concentrate the benefits of the projects into the hands of an even smaller group and would have disturbing implications for income distribution.

B. The PROTERRA

124. PROTERRA, promulgated in July 1971, sets aside 20 percent of fiscal incentive funds over a five-year period for a broad range of activities under the overall objectives of facilitating the access of people to Northeast land, creating better conditions of rural employment, and stimulating the growth of agro-industry in the North and Northeast. The total amount would be US$750 million equivalent.

Seven main sub-programs were identified in the decree:

(a) acquisition, or expropriation with compensation, of land for sale to small and medium farmers,

(b) real estate loans to small and medium farmers for the purchase of farms and for adding land to farms that are too small to afford adequate employment for the family,

(c) financing of agro-industry projects, including sugar, and of the production of agricultural equipment and supplies,

(d) financial assistance for the reorganization and modernization of farms, for agricultural research, for storage facilities, and for marketing, transportation, electrification and agro-utilities,

(e) financing for the acquisition of modern agricultural inputs;

(f) minimum price supports for export products; and

(g) demarcation of public lands and supervision of the use and possession of land.

125. Not until late 1972 were the implementing regulations issued. The delay in the definition of the PROTERRA illustrates that technical and administrative limitations are serious constraints to implementing any North/Northeast agricultural development strategy. It also shows the difficulty of striking a balance, under budgetary and political constraints, between market-oriented policy instruments -- such as credit and price incentives -- and programs directed to structural factors retarding agricultural growth, such as unsatisfactory land tenure, ineffective research and extension, poor rural education, etc. The pay-off of market incentives tends to be rapid and their claim on the very limited technical and administrative skills is relatively modest. On the other hand, market incentives -- even though effectively implemented -- will not reach the mass of farmers, unless they are accompanied by effective policies dealing with the structural problems of Northeast agriculture.

126. The 1972 allocation of PROTERRA funds gives an idea of the relative importance of the various programs.

Table 11: PROTERRA, ALLOCATION OF FUNDS, 1972 /1

(In 1972 Cr$ million)

	value	percent
A. Agricultural Credit	450	54
(Investment and Modern Inputs)	(200)	(24)
(Farm Ownership)	(150)	(18)
(Agro-Industry)	(100)	(12)
B. Agricultural Infrastructure	250	30
(Roads)	(185)	(22)
(Electric Power)	(65)	(8)
C. Research and Extension	80	9
D. Land Reform	60	7
TOTAL	840	100

/1 This is about 15 percent of the total amount to be spent on the program during the 1972-76 period. Applications for the years subsequent to 1972 have not yet been budgeted.

127. With regard to the dimensions of Northeast agrarian reform, INCRA -- by February, 1973 -- is to subject to expropriation in varying degree latifundios located in the socially tense areas of Pernambuco, Paraiba and Ceara. Only properties of 1,000 ha and above which are not efficiently exploited will be affected as follows:

Table 12: THE IMPACT OF NORTHEAST AGRARIAN REFORM

Area (ha)	Percentage of Land Expropriated
1,000	20
1,001 - 3,000	30
3,001 - 5,000	40
Above 5,000	50

These lands will not be subject to expropriation if, by February 1973, their owners present to INCRA and Banco do Brazil settlement programs involving

the splitting-up of the estates. The landowner is stimulated to present a settlement project by the fear of being expropriated and, therefore, of being paid with Agrarian Reform bonds, 1/ instead of cash. The beneficiaries may be either landless laborers or minifundio owners. They will become owners of the affected land by buying it from the landlords through the farm ownership credit line (credito fundiario) established under PROTERRA (see para. 130 below). The value of land will be determined by Incra, in accordance with forthcoming regulations.

128. The program seeks to place as much of the burden of project formulation and execution as possible on the landowners thus limiting the role played by INCRA. The notorious lack of managerial capability of many latifundistas, however, does not bode well for the success of the operation. Apparently, the landowners will select individual beneficiaries as they will become cosigners for the farm ownership loans. This system lends itself to distortions due to the risk factor, it is possible that newly divided land could be made available only to an elite minority of small holders or even former urban residents. If this happens, the reform clearly would not be a significant instrument for improving the distribution of land and per worker productivity. Although the limited technical capacity of INCRA personnel is recognized, more government participation in the program may be needed to avoid biases as well as to assure availability of extension services, inputs and credit to the beneficiaries.

129. At this juncture, it is extremely difficult to measure the impact of the agrarian reform element of PROTERRA in terms of land affected and number of beneficiaries. According to a rough estimate, some 700,000 hectares may be subject to redistribution in the first year of the program. This might benefit about 15,000 families out of more than one million rural families in the three states concerned. At a cost of $2,600 equivalent per family, the land settlement program will preempt a substantial portion of the PROTERRA funds. A major cause of this high settlement cost is the land component, which represents 32 percent of total cost. If the target is to reach the maximum number of families within the existing financial constraints, compensation procedures should perhaps be modified to lower capital costs to the Government.

130. In addition to land purchase, the agro-credit component of the PROTERRA centers on a series of credit lines for fertilizers, improved seeds, farm mechanization, farm improvement, agro-industries. The following are the terms of the various credit programs: 2/

1/ They usually yield 6 percent interest plus ORTN monetary correction, with maturity up to 20 years.

2/ Note that the lender is assured a minimum return of 15 percent in all cases since the Central Bank will cover the difference between this return and those specified below out of its own funds.

Table 13: TERMS OF PROTERRA CREDIT LINES

	Interest Rate (percentage)	Maturity[1] (Years)	Grace[1] (Years)
Agro-Industry	17	12	3
Land Purchase	Up to 12	12	2
Investment	7	12	6
Tractors	7	5	3
Modern Inputs	0	8	3

[1] Upper limit. Grace is included in maturity.

131. Some of these programs are already under way, following earlier deliberations of the Monetary Council. This is the case of the fertilizer program, (part of the modern inputs credit line), which centers on a wide demonstration campaign sponsored by the manufacturers' association (ANDA). The extraordinarily heavy degree of subsidization implied by the zero interest rate for this credit is justified by the Government as being necessary to promote improvement of Northeast agricultural technology. A similar program for improved cotton seeds has recently started.

132. The plans for massive injections of subsidized credit assume that increased use of machinery and other modern inputs is economic and that distortions in relative prices are impeding their application. Certainly, this is true to a certain extent as is demonstrated by the high cost of fertilizer. In fact, the value of the interest rate subsidy probably is not sufficient to offset the distortion in fertilizer prices although some improvement in this respect will be achieved once the new low-cost ammonia plant based on Bahia natural gas comes into production. On the other hand, this use of subsidized credit as a rural development technique, ignores two kinds of problems. The first is the problem of equity; existing credit mechanisms simply are not capable of extending subsidized credit to the majority of small farmers. This is true even if small farmers had the knowledge necessary to apply modern inputs effectively. The second problem applies over the entire income range of potential subsidized credit beneficiaries. Present knowledge of optimum agriculture production functions in the Northeast is far from sufficient to justify a massive shift in production techniques. Extension agents and research workers alike frequently complain of the lack of basis for making valid recommendations. Fertilizer trials show dependable, profitable responses for some crops in some areas, but a disturbing frequency of uneconomic responses for others. Moreover, even if production function research were adequate the extension services needed to assure the efficiency of the subsidized credit program are not available.

133. The Government can be expected to provide funding for agricultural research in the Northeast out of the Ministry of Agriculture budget as well as

via PROTERRA. In fact, about 5 percent of the 1972 PROTERRA budget is destined for research and demonstration activities. However, the Government is not yet organized institutionally to conduct the volume of research needed in the Northeast; needed reforms in this respect can be expected to require at least a year for implementation.

134. Most of the requirements for a more effective research program have been identified by Brazilian research administrators on the basis of their own experience and their past collaboration with external agencies -- FAO, IRI, USAID, and several American universities. Needed institutional changes at the national level are under consideration. The Government is planning to set up a national corporation for agricultural research which will have adequate administrative and financial independence to carry out an effective research program. The new corporation, being a separate public entity and not part of a Ministry, could be in a position to attract competent scientists by paying adequate salaries, i.e., salaries well in excess of civil service pay scales. In order to perform successfully the new corporation would need to expand the number of professional researchers not only well beyond the present level but perhaps even beyond the training capacity of existing educational institutions. Physical research facilities could also need to be modernized and greatly expanded.

The PROVALE

135. In February 1972 the Brazilian Government launched a US$150 million special program for the Sao Francisco Valley (PROVALE). This is fertile land in the states of Pernambuco, Bahia and Minas Gerais, relatively well supplied with water. PROVALE will be almost entirely funded by FIN and PROTERRA resources. The program calls for financing of:

(a) federal road construction;

(b) works to improve the navigability of the Sao Francisco river; and,

(c) colonization schemes and agro-industry projects.

While the infrastructure component of PROVALE is well defined, the agricultural programs have not yet been formulated with the exception of the ADELA-sponsored $100 million project in the Petrolina-Juazeiro area. Under ADELA's plan, development of the irrigated area would be accompanied by agro-industries for processing the output. If the viability of the ADELA proposal is substantially better than that of an earlier version of the project, it may be because of engineering modifications to reduce project costs, and improved market prospects linked to the agro-industry aspects of the ADELA version. A full economic -- as distinct from financial -- reappraisal of the project is, however, warranted (see paras. 116 - 123 above on irrigation).

C. Sugar Industry Reorganization

136. A program for reorganizing the inefficient Northeast sugar industry was introduced in 1971. Heretofore, distortions in the structure of this industry have been the principal cause of underemployment in the most densely populated area of the Northeast, the narrow coastal strip known as Zona da Mata. The zone produces little besides sugar, as it has since colonial days. The highest incidence of latifundios in the Northeast occurs in the Zona da Mata, which also presents the highest concentration of landless labor.

Previous Situation

137. The Northeastern sugar economy has the lowest productivity of all the world's sugar exporting regions. Cane yield per hectare is only 45 tons, against 59 tons in Sao Paulo and 250 in Hawaii. The yield of sugar is 90 kilos per ton of cane in the Northeast as compared to 94 kilos in Sao Paulo.

138. In summary, too great a reliance on marginal lands, low use of technical inputs (only one-third of the acreage under cultivation is being fertilized), inefficient utilization of labor, obsolescence of processing machinery and excessively small processing units are responsible for the low productivity in the Northeast sugar industry. As regards cane, production costs are high, not only because of low yields, related to poor nutrient content of the soil, but also because 35 percent of the sugar cane is presently produced on slopes of 20 degrees or over, which result in inadequate assimilation of fertilizer and moisture, prohibit economic use of tractors for deep plowing and lower cane cutters' productivity. Another factor negatively affecting Northeast production costs is the distance of sugar land from mills. The problem is magnified by poor transport infrastructure.

139. As shown below, sugar production costs in the Northeast are approximately 22 percent higher than in the Center-South. Most of the difference is due to Northeast inefficiency in sugar cane production rather than in sugar factory operations. The cost of a ton of cane in the Northeast is about 27 percent higher than in the South, despite the lower wages paid by the plantations located in the Northeast region. Cane production in the Northeast requires a 2-1/2 times labor input because of less efficient use of labor and lower level of mechanization. To attain the same yield requires more input in the Northeast in view of the poorer soil conditions. In addition, lower sugar content resulting from delays between harvest and processing contributes to higher production costs. Sugar factory operations are slightly less efficient in the Northeast in relation to the Center-South.

Table 14: PROFITABILITY OF SUGAR PRODUCTION IN CROP YEAR, 1969-70
(In 1969 Cr$)

		Northeast	Center-South	Northeast / Center-South
A.	Agricultural Costs (1 ton of cane) /1	20.65	16.27	1.27
	Direct Labor	12.14	8.57	
	Other Inputs	4.52	4.99	
	Administrative Costs	0.71	0.43	
	Transport	2.28	2.28	
B.	Cane Price Fixed by IAA /1	22.47	17.80	1.26
C.	Margin (B-A) /2	1.82	1.53	
D.	Industrial Costs /1 (60 Kg of sugar)	20.76	16.95	1.22
	Raw Material (cane)	14.98	11.36	
	Direct Labor	1.25	1.22	
	Other Inputs	4.80	3.84	
	Administrative Costs	0.53	0.53	
E.	Sugar Price Fixed by IAA /1	23.37	19.56	1.19
F.	Margin (D-E) /2	2.61	2.61	

/1 Excluding ICM.
/2 To cover profit, land rent, interest.

Source: IAA.

140. To protect the Northeast from the Center-South competition, the following system was implemented until late 1971:

(a) the interregional shipment of sugar was prohibited;

(b) maximum cane and sugar production quotas to individual producers and to states were assigned regardless of the efficiency;

(c) higher Northeast production costs were borne by Northeast consumers, as producer prices were fixed at a level about 20 percent higher than in the Center-South;

(d) price fixing and sugar marketing were the responsibility of the Sugar and Alcohol Institute (IAA) which, together with the Bank of Brazil controlled the financing of sugar production. Additional subsidization required by individual Northeast producers was made available by these two agencies.

141. Despite all these measures, Northeast sugar producers were unable to pay legal minimum wages to their labor force. Little or no progress was made toward improving the efficiency of either cane production or sugar processing. Less than subsistence wage rates prevailing in the zone generated serious social problems. Various unsuccessful efforts were made by the Government to resolve the problem, the penultimate one being the creation of the Executive Group for Rationalization of the Sugar Industry of the Northeast (GERAN). However, GERAN's technical staff did little more than study expropriation of marginal lands with a view to redistributing them to displaced cane field workers. GERAN was abolished in 1971. Earlier efforts had resulted in the creation of a few model canefield worker resettlement areas. These exercises encountered two kinds of problems: disagreement as to whether resettled workers should hold individual title to redistributed land or work it in common; and, lack of ready market for crops alternative to sugar cane.

Recent Changes in Sugar Policy

142. In 1971 the Ministry of Industry and Commerce, to which the IAA is subordinated, adopted a program to improve Northeast sugar productivity up to the levels presently being achieved in the Center-South. Briefly, the program consists of: 1/

(i) redefinition of the quota system: state quotas are abolished and replaced by two regional ones (Northeast and other); transfer of individual cane and sugar quotas between operators is facilitated; provision for withdrawal of quota from any mill inoperative for three consecutive seasons beginning with the 1968-69 harvests is made;

(ii) creation of special financing facilities for producers who will (a) merge and/or reequip sugar mills; (b) integrate and relocate cane production and milling. The credit program is administered by Banco do Brasil. Funds are provided from the IAA's export profits. Lending terms are 12 percent nominal interest rate, up to 12 years maturity, including a three-year grace period.

1/ The following (i) and (ii) apply to Center-South sugar industry as well.

(iii) the adoption of a uniform sugar price throughout the country fixed at a level corresponding to Center-South production costs. Up to the 1972-73 harvest, uniform profit margins are assured by a subsidy paid by the IAA from its export profits. The subsidy is equivalent to the 20 percent production cost difference between the Northeast and the Center-South. But starting from the 1973-74 the subsidy will be gradually reduced to nil over a six-year period according to the following schedule:

Table 15: SCHEDULE FOR GRADUAL ELIMINATION OF NORTHEAST SUGAR PRODUCERS' SUBSIDY /1

	Percent Reduction
1971-72	-
1972-73	-
1973-74	5
1974-75	10
1975-76	15
1976-77	20
1977-78	25
1978-79	25
	100

/1 Subsidy originally equals the 20 percent reduction in sales prices imposed on Northeast millers in 1971.

(iv) the allocation of PROTERRA funds to finance the reoccupation of cane and mill workers left in surplus by productivity improvements.

143. The incentive provided by this program to rebuild and reequip sugar mills, to consolidate and merge so as to achieve economies of scale and replace old technologies with new ones is being responded to by mill owners. By late 1972, 24 projects had been submitted and 10 approved. Quotas of 34 mills, not operating for many years, have been cancelled.

144. The problem of landowners' adjustment to the new program, while serious, probably remains small compared to that of the displaced canefield and mill workers. In the short run, the sugar modernization program will bring about a reduction in employment, which is difficult to quantify, being tied to the number of projects that will be eventually presented. As already discussed, the sugar industry reorganization decree called for allocation of PROTERRA funds to finance the reoccupation of cane and mill workers left in surplus by productivity improvements. Unfortunately, so far no scheme has been set up for this purpose. More recently, the Government has decreed that land reform will be extended to the sugar cane zone (see para. 127 above), but no program is being implemented as yet.

145. The present government program certainly represents a step in the right direction. What is missing, however, is an overall approach to the problem and adequate emphasis on the employment effect and on land productivity. There is a danger of lack of coordination between the IAA program primarily related to modernization of the sugar mills and the agrarian reform action of INCRA. In addition to improving the productivity of cane production through abandonment of marginal lands and improvement of technology, a coordinated program should also envisage alternatives to cane production for labor and land left idle by the reorganization. According to a study prepared by U.S. consultants, 1/ production from suitable Northeast lands that would remain under sugar could be increased from the present levels of 45 tons to at least 70 tons of cane per hectare. Thus, with a 30 percent reduction in land, the Northeast should maintain its present volume of sugar production. While this productivity improvement would increase wage rates for retained labor, the consultants concluded that employment would have to be reduced from 450,000 to 325,000 jobs in a 10-year modernization program. Thus a coordinated program should envisage the diversion of about 190,000 hectares presently in sugar to other crops as well as the reoccupation of some 115,000 cane field workers. Moreover, the land left idle would not necessarily provide employment for the labor liberated in this process. Soil conservation measures, such as bench terracing, would in any case be necessary. Unfortunately, one of the most financially attractive alternative uses for the land -- livestock production -- would create little employment.

146. It has been estimated that, at the present status of agronomic knowledge, crop and livestock activities on released sugar land could employ about 35,000. The remaining 80,000 workers would have to find employment elsewhere. This reemphasizes the importance of agricultural research which could well identify more labor intensive methods of exploiting not only the cane fields to be left idle by sugar reorganization but, perhaps much more importantly, the approximately one million hectares of land already idle on the sugar estates.

147. Most of this already idle land is made up by the tabuleiros (elevated plains) which have been the object of study for more than a decade. There are indications that the tabuleiros could provide employment for several thousand families in a not too distant future. Soil fertility is the major cause of low yield on the tabuleiros but not the only one. Their sandy soils have very low capacity to hold mineral nutrients. Soil moisture deficit due to water scarcity is another factor affecting yields. However, Alagoas sugar growers have demonstrated that under proper management, the tabuleiros can be used to produce sugar with a fair degree of efficiency. Presumably they could also be used to produce other crops given use of proper technology.

148. Finally, in addition to finding the suitable product mix and technology for existing soils, any comprehensive program of sugar zone development must contemplate the retraining of a labor force whose technical competence presently is limited to sugar production.

1/ Hawaiian Agronomics International, Diversification and Modernization of Agriculture in the Sugar Cane Zone of Northeast Brazil.

149. A sugar diversification project is presently being prepared by the Pernambuco State Government. It will bring about land tenure modifications while placing emphasis on vertical integration of agricultural production with processing of tropical fruits (such as pineapple, passion fruits and cashew). Seventy-five thousand hectares of surplus sugar land will be expropriated and redistributed among large establishments belonging to processing industries and 2,500 family farms of around 20 hectares which will be devoted to both subsistence and agro-industry crops. The cost of the project, which has an important infrastructure component (feeder roads, electricity, etc.) is expected to be around $US30 million. Again the success of the project will depend on the experiments presently being conducted on alternative crops.

IV. GROWTH PROSPECTS AND RESOURCE AVAILABILITY

A. Prospects for Growth and Employment

Growth in the 1970's

150. Northeast development agencies, such as SUDENE and BNB, are engaged in indicative planning for Northeast development in the 1970's. Ten percent per annum growth is considered feasible to be achieved as follows:

Table 16: THE SECTORAL COMPOSITION OF GROWTH

	Growth Rates		GDP Structure (Percentage Composition)	
	1960-69	1970-80 (Projected)	1970	1980 (Projected)
Agriculture	4.8	6.5	28	20
Industry	7.5	15.0	25	36
Services	7.2	10.0	47	44
GDP	6.5	10.0	100	100

Source: BNB.

151. This would be a substantial achievement, even for economies with a greater resource endowment than is currently visible in the Northeast. The 10 percent regional growth target reflects the concern of the Government with narrowing the per capita income gap between the Northeast and the rest of Brazil, as well as its ambitious growth targets for the country as a whole. With an expected population growth of 2.4 percent, the per capita income of the Nordestinos, growing at 7.4 percent annually, would double by 1980. In that year, it would reach US$340 per capita, still only about 50 percent of the national average, on the assumption that the Brazilian economy as a whole expands at an 8 to 9 percent pace and that overall demographic growth averages 2.8 percent.

152. Northeast growth would be accompanied by substantial structural change, as the share of industry in regional product is expected to increase from 25 percent in 1970 to 36 percent in 1980, and that of agriculture to decline from 28 to 20 percent. Despite further industrialization, the structure of the Northeast economy in 1980 would be comparable to the one prevailing in Brazil in the late 1940's.

153. Rapid acceleration of Northeast growth is predicated upon (a) the coming on stream of the industrial and infrastructure projects formulated in the 1960's, and (b) the impact of government programs, such as PIN and PROTERRA, on agricultural sector growth.

Agriculture

154. Agriculture is expected to play a crucial role in Northeast development during the 1970's. It must provide food for a population reaching 36 million by 1980, raw materials for expanding industry, exports to the rest of the country and also abroad, as well as employment to a sizeable portion of the labor force.

155. At rates of economic growth averaging 10 percent per year, regional demand for Northeast agricultural products will be such that the growth of the sector could be expected to average 6.5 percent annually. Thus, the bulk of the region's products will continue to be consumed locally, so that regional population, per capita income and income demand elasticity are the most important parameters on the demand side. Exports of Northeast agricultural products can be expected to grow more rapidly than 6.5 percent annually, but their impact on agricultural sector growth is limited by the preponderant role now played by regional demand. In 1970 exports to the rest of Brazil and abroad accounted for only 17 percent of total Northeast agricultural output.

Table 17: PROJECTED GROWTH OF DEMAND FOR NORTHEAST AGRICULTURAL PRODUCTS, 1970-80

(1970 production = 100)

	1970	1980 (Projected)	1970-80 Annual Increase (%)
Food	71	128	6.1
Exports	17	33	7.0
Non-food	12	27	8.4
Total	100	188	6.5

156. The components of the projected 6.5 percent overall rate of growth in demand for Northeast agricultural products, therefore, are: regional demand for foodstuffs, 6.1 percent; export demand 7.0 percent and regional demand for non-food products such as cotton, sisal and wood, 8.4 percent, the latter being related to the expected growth in production of textiles, wool and paper.

157. Underlying the projection of regional demand for foodstuffs are the following parameters:

(a) population growth: 2.4 percent;

(b) growth in per capita income: 7.4 percent on the assumption of a regional GDP growth of 10 percent and no change in the relationship between GDP and disposable income;

(c) income elasticity of demand for food: 0.5, on the assumption of no change in the historical coefficient. 1/ This, in turn, assumes no basic change in income distribution.

158. A 6 percent annual increase in food demand, as compared to 2.4 percent population growth, implies a substantial improvement in Northeast average caloric and protein intake, although minimum requirements will still not be met, on an average basis. This means that, substantial income redistribution probably would have to take place in order to eliminate nutritional deficiencies by 1980 even at 10 percent economic growth.

Table 18: CALORIE AND PROTEIN INTAKE AS PERCENTAGE OF FAO MINIMUM REQUIREMENTS - 1970 AND 1980

	Calories			Proteins		
	Vegetable Origin	Animal Origin	Total	Vegetable Origin	Animal Origin	Total
1970	130.3	22.8	76.6	98.1	51.7	74.9
1980 (Projected)	142.2	29.9	86.0	112.5	66.9	89.7

Source: BNB.

159. As incomes grow, demand for protein rich food like meat, milk and eggs will expand much faster than demand for traditional components of the region's diet such as manioc flour, beans and rice. The expected structural changes in food demand should serve as guide for re-orienting regional agricultural supply in the next few years. In addition, there would appear to be scope for programs designed to modify the diet of the Northeasterner with a view to improving his calorie and protein intake at prospective income levels (See Chapter V).

160. The outlook for Northeast agricultural exports is, on the whole, favorable. Except for cotton, demand prospects for the major Northeast export crops are very good. 2/ Export prospects must also be considered within the context of Center-South supply situation. In the next few years, it is likely that the contribution of Center-South production to exports of crops that are grown in both regions (e.g., sugar and cotton) will decline. This will be the result of increasing competition that sugar and cotton will encounter from other crops in the Center-South. For example, cotton in Sao Paulo State competes with coffee and pasture, in addition to such annual crops as corn and

1/ See the 1967 FGV study "Projections of Supply and Demand for Agricultural Products of Brazil."

2/ For details see Main Report.

soybean. All these crops competing with cotton have excellent demand prospects. On the other hand, because of ecological conditions, both cotton and sugar in the Northeast are faced with little economic competition from other crops. Despite lower productivity in the North East, in the longer term, it may pay to limit Center-South production of sugar and cotton to regional demand and to expand Northeast's share of the domestic market in order to cover Northeast demand as well as exports. The interregional production shift may be helped by concomitant increase in Northeast yields.

161. Expected development in the coffee sector may also contribute to the growth of Northeast exports. As a consequence of the mid-1960's coffee diversification programs, and, more recently, of the coffee rust, as well as of the 1972 frost, Brazil is presently confronted with a supply problem. 1/ A wide-ranging program designed to promote the planting of 600 million new trees over the 1973-75 period and to increase productivity through application of fertilizers, fungicide, pesticide and tree spacing has been put into effect. Another aim of the present planting program is to promote coffee production in areas outside the Center-South, such as Espirito Santo, Northeast and Amazonia. In the Center-South, coffee is still the most profitable of major crops but is likely to encounter increasing competition. First, freeze constitutes a risk for growers in the major producing areas (such as Parana, and to a lesser extent Sao Paulo) which is not prevalent in the case of alternative crops. Second, the export corridors program will increase the attractiveness of crops alternative to coffee, by providing credit, infrastructure and processing facilities. Another factor favoring the Northeast is the labor intensity of coffee production for which no mechanized technology has been developed. Farmers in the Center-South already complain of the shortage of seasonal labor. As the Center-South labor surplus is absorbed in the long term, one could envisage coffee becoming an inappropriate crop for traditional areas, better left to other regions like the Northeast where alternative investment opportunities are less attractive and labor is abundant.

162. Looking to the nearer future, the response of Northeast states to the special coffee credit programs has been very good. Financing for the planting of 45 million trees in Bahia, Ceara and Pernambuco during the current planting season has already been contracted with banks. This would permit the doubling of Northeast coffee production 2/ in the next four years. If the planting program is stepped up to 100 million new trees, by the end of the decade, Northeast coffee production should be sufficient to cover regional demand. In the 1980's exports to Center-South could be envisaged. Although ecological conditions do not allow coffee growing in most Northeast areas, the areas where coffee can grow are generally free from coffee rust and freeze.

163. Turning to export crops which do not compete with the Center-South, prospects for increasing cocoa exports are also favorable. World demand for

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1/ For further details see Main Report.

2/ One hundred and four thousand bags in 1970-71.

cocoa products is likely to continue to expand at the present 5 percent growth rate. At the same time Brazil, whose production is totally concentrated in Bahia, may be able to keep its share in the world market if the CEPLAC cocoa tree rehabilitation program proves to be successful. Due to the present low level of world stocks and the substantial increase in world production which is estimated to be necessary to maintain supply and demand in balance, cocoa prices are expected to increase somewhat in the next few years. In the past, Brazil's cocoa production has been hampered by violent fluctuations in export prices, and therefore, in producers' returns. The Government might study the feasibility of establishing a minimum price program for cocoa as is implied in the PROTERRA decree (see para. 73 above). As a first step, the present 15 percent export tax could be made variable to reflect changes in export prices. The cashew nut is another export product with excellent demand prospects. There is also great potential for other crops whose present weight in the Northeast's export trade is minimal: sesame, sunflower, melons, pineapple and other tropical fruits (frozen mango, tropical fruit cocktail, etc.). In addition to the expansion of external and internal demand, import substitution could be a source of output growth. Imports from other regions of Brazil, however, probably account for only about 5 percent of Northeast demand. Room for import substitution exists in the case of rice, vegetables and meat. There are indications that the region's deficit in beef production may become increasingly critical. Approximately 15 to 20 percent of the fresh beef consumed in the region is supplied by inshipments of live cattle. Assuming that elasticity of demand for fresh beef is around 0.7, as recent studies point out, and further assuming a population growth of 2.4 percent and income per capita growth of 7.4 percent, Northeast demand of fresh beef will double in ten years. It is hoped that the interest of international lending agencies, such as IDB and IBRD, in the livestock sector may help the Northeast in overcoming the supply deficit. The most critical deterrent to animal productivity in most of the Northeast is shortage of supplemental food during the long seasonal dry periods. The problem requires long-range intensive research programs to find answers. Again, the economic feasibility of fertilizing pastures to increase grazing productivity has not been clearly defined in the Northeast. Evidence to date indicates that phosphorus is the most critical element and that more needs to be known about its use under different soil and climatic situations. There is no a priori economic reason why the Northeast should become self-sufficient in foodstuffs, but import-substitution activity such as meat production could improve the use of land and labor, despite its low labor absorption.

164. Turning to the supply side, the 6.5 percent expected growth in demand for Northeast's agricultural products compares with a 4.5 percent long-term growth rate of the sector. Acceleration of the rate of agricultural growth in line with projected demand should be feasible, particularly in view of the recently formulated government programs. The rapid growth of the agricultural sector, however, cannot be sustained only by bringing more land under cultivation. If land usage continues to increase at 4-4.5 percent per year, a land deficit will appear in some of the Northeast states by 1980 and in most of them by 1990. Maranhao, Piaui and Bahia, on the other hand, offer land available for cultivation that, at this expansion rate, is not going to be exhausted until the end of the century. However, infrastructure in these states is lacking and little is known about their soil performance.

165. Productivity gains become, therefore, necessary. There are some crops, such as sugar, cotton and cocoa, whose yields can increase with the introduction of improved, disease-resistant varieties. In addition, selective use of fertilizers in lands with suitable soil conditions and water availability may lead to increased productivity. Moreover, agrarian reform should bring about a more intensive use of lands already under farming and the impact of the irrigation programs should also be felt during the 1970's. Further gains from expanded cultivation and marginally improved productivity can be enhanced by improvements in transport, storage and marketing facilities which will reduce the enormous wastage of agricultural products now being experienced. Summarizing the prospective impact of the development program on agricultural output in the Northeast, it appears that, without special efforts, the rate of growth could remain at historical levels (4-4.5 percent). A concerted effort on research, extension, supervised credit, infrastructure (feeder roads and storage) and agrarian reform could lead to an increase of the growth rate to 6.5 percent.

Manufacturing Industry

166. Despite the shift in government policies, manufacturing industry is likely to remain the leading sector for regional growth. SUDENE and BNB consider a manufacturing growth of 15 percent per annum feasible. At present, about 72 percent of regional industrial production is directed to the Northeast market and the remaining 28 percent is exported to the rest of Brazil or abroad. On the demand side, constraints should not appear as incomes, and, therefore, demand for industrial goods, growth in the region, and improved efficiency as well as better transport infrastructure facilitate the access to markets outside the region. By 1980 Northeast population will be around 36 million, half living in the cities, with an income per capita of $370, on the assumption that regional GDP will grow at an average annual rate of 10 percent. Using the historical demand elasticity of 1.4, the expected growth rate of demand for manufactured goods is around 14 percent. The competitiveness of Northeast industry should improve substantially in the next few years, as many enterprises that were established during the 1960's will have completed their run-in period. In addition, an improvement can be expected in external economies such as infrastructure and inter-industry relations, as well as in the quality of the labor force and management. Under these circumstances, 15 percent per annum increase in regional exports of manufactures should be feasible. As to interregional exports, the Northeast should be able to increase its share in the manufactured goods market in the rest of Brazil, which is expected to grow by at least 10 percent per annum in the next several years. Criticism of the 34/18 scheme has sometimes attacked the idea of interregional exports made from 34/18 projects, presumably from a belief that subsidized competition for sales to the rest of Brazil was in some way more unfair than such competition within the Northeast. Interregional exports, however, are a valuable sign of the projects' economic viability. It means that the firm is relatively efficient by Brazilian standards -- the first step toward competing in the world market. This applies particularly for products such as textiles, non-ferrous metals and chemicals. As to exports abroad, the point system will be revised shortly by giving more emphasis to production for

exports. SUDENE has been recently very active in stimulating manufactured exports through the creation of various export promotion centers. Although still at very low levels, Northeast manufactured products, such as textiles, shoes, telecommunications equipment, air conditioners, etc., are already being exported to Europe, Africa and North America. At present, Northeast manufactured imports, from the rest of Brazil and abroad, correspond to 58 percent of the regional market. A production growth rate of 15 percent accompanied by a similar increase in regional exports would be consistent with a decline in the import share of the Northeast market to some 54 percent by 1980. Import substitution, therefore, is not likely to play a major role in the development of Northeast industry during the 1970's.

167. On the supply side, the increase in manufacturing gross value added that the projects approved through 1971 may be expected to produce is estimated to be about 14 percent per annum from 1969 to 1976, compared to a rate of 5.3 percent for the period 1956-69. This projection is based on the assumption that projects approved through 1971, most of which have not started production yet, will operate at 85 percent capacity. 1/ The same projections show also some interesting developments with respect to the altered structure of industrial output which may be anticipated from the projects approved by SUDENE thus far. The relative shares of the so-called traditional and the more dynamic industries had already been changing in favor of the latter. The projections indicate that this process will be accelerated and that in consequence the structure of industry in the Northeast will be a much more diversified one than that of earlier years and therefore, less vulnerable to temporary crisis in any particular sector.

168. Regarding new products to be approved in the 1970's, the comparative advantage of Northeast industry resides in (a) exploitation of natural resources; (b) use of cheap labor. As for (a), investment is expected to concentrate in non-ferrous metals (copper, manganese and aluminum), petrochemicals and processing of agricultural goods. As for (b), labor intensive subsectors such as textiles, shoes and electronic components should attract additional investment. A better integration of regional manufacturing industry, by taking advantage of backward and forward linkages, will be another stimulus to investment.

169. An interesting new policy development in foreign trade should have a positive impact on Northeast exports. As of August 1972 the Government authorized the duty-free transfer to Brazil of entire used industrial establishments on conditions that at least one-third of their output be exported. This is departure from past policy, forbidding the importation of used equipment, on account of bad experiences both in the Northeast and elsewhere. The Northeast is likely to benefit from this new orientation designed to exploit

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1/ At present, Northeast manufacturing industry is estimated to operate at 75 percent capacity.

Brazil's comparative advantage in the form of cheap labor and raw materials. A Canadian firm dealing with sisal processing and textile concerns from Japan and Taiwan have already expressed their interest in transferring its plants to the Northeast. In addition to labor, the region can offer an adequate supply of the associated raw materials.

The Bahia Petrochemical Complex

170. A major absorber of scarce 34/18 funds is almost certain to be the Bahia petrochemical complex to be installed during 1977-80 at a total cost of US$1 billion (including fourth generation firms). The Government has determined to install in Bahia a second petrochemical complex almost equal in capacity and cost to that of Sao Paulo. Apart from regional development policies, the location is justified by the existence of natural gas, rock salt and potash deposits in Bahia and Sergipe. Development of the Bahia petrochemical complex has been studied by Japanese and French consulting firms. The studies are complete and the Government is expected to take an early decision as to the timing and composition of the investment. The central element of the new complex will be a basic feedstock production unit costing about US$150 million. This unit would provide ethylene, propylene, benzene, toluene, xylenes and other basic feedstocks to the second, third and fourth generation downstream plants, making up the bulk of the new complex. PETROQUISA, a PETROBRAS subsidiary, will be responsible for the construction and management of the basic feedstock production unit, although downstream plants will be asked to share its cost. A mixed company will be formed for that purpose with PETROQUISA, domestic enterprises and foreign interests, each contributing to the capital of the new enterprise. As the natural gas reserves will also be tapped by a new Petroquisa 1,000 ton per day ammonia facility, for fertilizer production, the Government now contemplates feeding the Bahia feedstock plant with a mixture of natural gas (one-third) and naphtha (two-thirds). Such a mixture would give the Bahia facility an important advantage vis-a-vis Sao Paulo's basic feedstock unit. Petroquimica Uniao, which is entirely naphtha-afed it would yield a relatively higher ethylene (polyester fibers, household plastic goods, construction materials) and relatively lower propylene (detergents, acrylic glass and fibers) content.

171. The Bahia reserve is estimated to contain 27 billion cubic meters of natural gas. Although some of this gas presently is being reinjected, even more -- 412.2 million cubic meters in 1970 -- is being lost in connection with the extraction of crude petroleum. Petrobras had assumed responsibilities to provide 665.5 million cubic meters of gas annually for: the ammonia operation (300 million m^3); for 5 downstream petrochemical plants (220.4 million m^3); and for the USIBA direct reduction steel mill (115.0 million m^3). If the Bahia feedstock facility were to be entirely gas fed, annual gas consumption would rise to about 1,665 million cubic meters and the reserves entirely depleted in 15 years, too brief a period to justify the plan investment involved. With gas covering only one-third of the feedstock plant's requirements, on the other hand, total gas use will approximate one billion cubic meters annually, so that reserves would be depleted in 27 years. An additional factor to be taken into account is the

prospect of bringing into production natural gas reserves located in the continental shelf off the coast to the neighboring state of Sergipe. With the large initial scale of the Bahia operation the efficiency of overall petrochemicals output should improve. Additional transport costs imposed by the fact that most of the output of the Bahia complex will have to be marketed in the Center-South will tend to be offset at least to a certain extent by the location of the Bahia pole at the source of its natural gas input. Perhaps the major uncertainty associated with the petrochemical development contemplated by the Government has to do with the competition between fertilizer and petrochemical production for natural gas, a scarce resource in Brazil.

172. Investment expenditures in 1973-77 are expected to be around US$600-700 million. At present, the Government envisages the following financing scheme: 35 percent external financing, 25 percent firms' own resources and 40 percent 34/18 funds. Thus the Bahia petrochemical complex is likely to absorb about 30 percent of overall 34/18 funds being available for industrial investment during that period. Given the national relevance of the project and its low labor absorption, a smaller participation of 34/18 funds, associated with a larger inflow of external resources may be justified.

Other Sector

173. Turning to the other branches within industry, a rapid growth of the construction sector can be also expected, taking into account the BNH housing program and private and public sector investment projects in infrastructure and manufacturing. With the recent intensification of mineral research, mining is expected to contribute substantially to the region's growth in the 1970's. Exploitation of petroleum, potash and natural gas in Sergipe and of copper projects in Bahia is likely to be the main component of the sector's growth. Finally, as to electric power, ELETROBRAS plans a 16 percent annual growth of electric energy production in order to meet expected demand.

174. The Northeast offers great tourism attractions stemming from its climate, beaches, historical sites, folklore and proximity to the Amazon region. This potential began to be exploited only recently. The upper- and middle-class population of Rio and Sao Paulo represents the most important market for Northeast tourism. Unfortunately, international tourism to the Northeast, as well as to the rest of Brazil, is hampered by high air fares. By 1980 the potential market in Rio and Sao Paulo should conservatively generate a flow of about 140,000 visitors annually, against 60,000 in 1970. Foreign tourists may increase from 15,000 in 1970 to 60,000 in 1980, mostly as a result of an increasing share of foreign tourists to Brazil visiting the Northeast. On the supply side, efforts must be made in order to enhance the attractiveness of Northeast. In addition to the improvement and construction of the hotel network, construction of tourist beach villages, restoration of historical sites, lowering of domestic air fares for international tourists may be considered. If the 300,000-tourist target is reached, the sector's contribution to regional GDP by 1980 may reach

some one percent. 1/ Thus, developing tourism in the backward regions of Brazil, may become a significant factor in redressing regional imbalances in employment and income.

Employment and Income Distribution Implications

175. Even with both agriculture and industry expanding very fast, the existing large pockets of underemployment plus the continuing rapid growth of the labor force are such that continued interregional migration will be necessary to ease the poverty problem in the Northeast. Using the SUDENE/BNB growth targets discussed above, it is possible to gain a general impression of employment prospects. The employment impact which would follow the achievement of the sectoral targets depends, of course, on the future changes in employmet-output elasticities. This is difficult to forecast. The projections below assume that past elasticities continue to prevail for agriculture and services. For manufacturing, there is more definite information in the form of the pipeline of SUDENE-approved projects, which is expected to create about 300,000 jobs in this decade. In addition, it is reasonable to assume that construction and utilities sectors expand their employment by roughly similar proportions in response to the growth in manufacturing.

Table 19: EXPECTED GROWTH IN EMPLOYMENT AND LABOR FORCE, 1970-80

	Annual Growth (%)		Elasticity	Absolute Increase, 1970-80
	Output	Employment		('000)
Industry	15.0	5.5	0.37	640
Services	10.0	5.4	0.54	1,241
Agriculture	6.5	0.5	0.08	264
TOTAL	10.0	2.3	0.23	2,145
Expected Growth in Labor Force		2.9		2,767
Deficit				622

176. These magnitudes indicate that, even if the expected employment growth is achieved (which would be a considerable accomplishment) there would still be a need for the migration of a little more than 600,000 Northeast workers if the existing backlog of underemployment comprising about 1.8 million were not to increase. The prospects for reducing underemployment in absolute terms are thus dependent upon how great the outmigration is in

1/ Even for a country such as Jamaica, where tourism has become a leading foreign exchange earner, the sector's net contribution to GDP is no more than 5 percent.

excess of 600,000, and, of course, on possible changes in employment [illegible] elasticities. The expected job deficit is not likely to be fully absorbed by the Amazon colonization scheme. Even under the most optimistic [illegible] tions, the Amazon region will not be able to absorb 700,000 Northeast families, as it was announced at the outset of the program. Probably 1[illegible] families, involving 375,000 workers is a more realistic estimate. Continued migration to the Center-South will be necessary. As previous patterns have shown, 600,000 workers equates to about 1.4 million people [illegible] implies a migration rate of about 4 percent, against [illegible] percent in the [illegible] barring a recurrence of drought, it seems unlikely that migration [illegible] substantially [illegible] the 4 percent rate. The chances of [illegible] underemployment through migration, therefore, seem slim. [illegible] change [illegible] employment-output elasticity, it seems that the only [illegible] the historical coefficient may be improved in agriculture. [illegible] [illegible] devising agricultural programs that [illegible] [illegible] On the other hand, labor absorption in Northeast agriculture [illegible] increase [illegible] emphasis on productivity rather than [illegible]

1[illegible]. [illegible] expected growth rate [illegible] about a [illegible] change in the employment [illegible] the regional economy. As the table below shows, agricultural [illegible] employment would decline by [illegible] percent, implying a more rapid [illegible] than in the previous decade. The services sector, [illegible] still provide the bulk of the [illegible] employment.

Table 20: SECTOR SHARES OF EMPLOYMENT, 1970-80

	[illegible]	[illegible]	[illegible]	[illegible]
Industry	9[illegible]	1[illegible]	[illegible]	
Services	2,259	27.[illegible]	[illegible]	
Agriculture	5,127	61.7	[illegible]	[illegible]
TOTAL	8,362	100.0	10,305	[illegible]

17. The impact which these changes may have on incomes is difficult to assess without a more detailed knowledge of the types of activity making up the new employment. In industry, although its share might not expand very rapidly, the prospect is for a larger proportion of new employment to be in organized activities yielding relatively high incomes. This seems assured by the existing pipeline of SUDENE-approved projects, all of which involve modern sector operations offering contractual wage employment. In addition higher wage industrial branches are expected to grow further than traditional branches. The employment growth in services, however, offers less grounds for optimism. A high proportion of the labor absorbed into services may be taken up into the low income unorganized sector, or in the poorer grades of the public sector.

179. The growth of incomes within agriculture will depend to a large extent on the successful implementation of the various public programs to boost per worker productivity. Land redistribution could improve rural income distribution, if the beneficiaries are, in fact, minifundistas and/or sharecroppers and if they are able to exploit their new land economically. On the other hand, efforts to increase productivity through the use of subsidized credit may have a perverse distributional impact. There are two reasons for this. One is the existing structural bias whereby credit institutions tend to restrict their lending to the larger farmers. The second is that especially by virtue of the subsidization of credit conceded to finance labor-saving technology improvement, the principal benefit of productivity increases is likely to accrue to the landholder in the form of profit. 1/ The policy implication is that if perverse income redistribution effects of modern inputs are to be minimized, not only must the credit mechanism make inputs available to small farmers on an equal footing with large, but there may also be a case of skewing the channels towards the small farmers, so that the differential impact on profits versus wage bill will be lessened by reaching farms employing primarily profit-sharing family labor rather than hired labor.

180. Finally, it should be noted that improvement in the distribution of agricultural credit would not, by itself, guarantee improvement in rural incomes. Many small farms in the Northeast may still be not viable because of the land limitation.

B. Investment Requirements

The Capital-Output Ratio

181. The amount of fixed investment required to support rapid regional growth depends on the value of the incremental capital-output ratio (ICOR). The historical evidence 2/ for determining the ICOR of the region is severely limited. In the late 60's, the Northeast ICOR was probably around 3.0, as against 2.1 for Brazil as a whole. The difference is attributable in part to the fact that while there was considerable excess production capacity in the rest of the country, Northeast growth during these years was characterized by heavy infrastructure expenditures, as well as the build-up of industrial capacity which has yet to come fully on stream. Unfortunately, there is not enough hard evidence to test the hypothesis attributing interregional

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1/ Use of fertilizer and improved seeds tend to raise the profit/value-added ratio as labor costs remain unchanged to the extent that wages are constant and labor requirements are proportional to land area (plowing, weeding) rather than output (harvesting, threshing).

2/ It consists of 5 years of observation (1965 through 1969) for the whole economy and 10 years of observation for the agricultural sector and the public sector. See SUDENE - Produto e Formacao Bruta de Capital do Nordeste do Brasil, 1965-69.

differences in ICOR values in terms of consistent higher returns on both private and public investment in the Center-South vis-a-vis the Northeast. The only information available is the above-mentioned data on ex-ante rate of return calculation for SUDENE-approved projects, averaging between 22 and 32 percent (see para. 75 above), and the actual average return on investment of Brazilian corporations during 1960-69, corresponding to 15 percent. Moreover, those are financial, rather than economic rates of returns. The issue requires further study. Any attempt to improve the present knowledge of the subject should deal, inter alia, with the evaluation of the interregional opportunity cost of labor (see para. 20, above).

117. As to the ICOR value prevailing in the 1970's, the mission estimate is that it will average 2.8. 1/ The selection of this ratio, which implies a slight reduction in relation with the recent past, is based on the following considerations: (a) the coming into fruition of the industrial and infrastructure projects started in the 1960's as well as expected improvement in the productivity of new investment, as a consequence of external economies, better project formulation, etc. (b) the increased emphasis on social investment will necessarily offset part of the ICOR reduction which (a) may bring about.

118. If the 10 percent economic growth target established for the Northeast is to be achieved, therefore, fixed investment would have to grow by about 16 percent annually; fixed investment would have to rise to the equivalent of 31 percent of regional GDP by 1976 as against 27 percent in 1969.

119. As a consequence of the recent shift in federal government policies toward the Northeast, the respective roles of private and public (direct or indirect) investment will change substantially in the next few years. Whereas in the late 1960's the share of the public sector investment in total Northeast investment averaged 43 percent in 1972-74 it is expected to increase to 57 percent. This is a result of the shift of 50 percent of 34/18 funds from private manufacturing investment to federal (direct and indirect) investment in agriculture and related infrastructure under the PIN and PROTERRA programs. State social investment will also contribute to the expansion of the role of the public sector.

The Northeast Public Investment Program

120. The mission was able to make indicative projections of public investment for the Northeast, which, essentially, consists of:

(i) Federal investment, corresponding to direct investment by the Federal Government and federal autarkies plus the PIN irrigation program and PROTERRA expenditures in the Northeast as shown in the 1972-74 Federal Investment Budget.

1/ The projected 2.8 ICOR is the weighted average of:
(a) 2.3 for agriculture, as compared to 1.9 in 1960-69;
(b) 3.0 for industry, including 2.0 for manufacturing, as compared to 3.5 in 1965-69;
(c) 3.0 for services as compared to 3.1 in 1965-69.

Table 21: NORTHEAST BRAZIL - FIXED INVESTMENT BY PUBLIC SECTOR AND BY PRIVATE SECTOR, 1971-76

(In Cr$ millions at constant 1971 values)

	Estimated	Projection					Average Annual Increase (in %)	
	1971	1972	1973	1974	1975	1976	1966-71	1971-76
Total Fixed Investment in Northeast 1/	7,500	9,257	10,172	11,503	13,215	14,460	9.6	14.0
Public Sector Fixed Investment	3,000	5,122	5,882	6,538	7,395	8,305	5.7	22.6
Federal 2/	1,852	3,267	3,702	4,197	4,777	5,437	6.4	24.0
(Direct)	(1,780)	(2,500)	(2,875)	(3,300)	(3,800)	(4,370)	6.4	19.6
(PIN-Irrigation)	(72)	(227)	(227)	(227)	(227)	(227)	-	...
(PROTERRA)	(-)	(540)	(600)	(670)	(750)	(840)	-	...
States 3/	925	1,555	1,800	1,927	2,100	2,308	5.7	20.0
Municipalities 3/	223	300	380	414	518	560	1.4	20.0
Private Sector Fixed Investment	4,500	4,135	4,290	4,765	5,820	6,155	11.3	6.5
SUDENE-Approved Industrial Investment 4/	1,750	2,380	2,375	2,415	2,665	2,665	44.8	8.8
(With Art. 34/18 Investment Funds)	(770)	(1,000)	(950)	(850)	(800)	(800)	45.1	0.8
(With Supplementary Funds)	(980)	(1,380)	(1,425)	(1,565)	(1,865)	(1,865)	44.6	13.7
SUDENE-Approved Other Investment 5/	190	205	-	-	-	-	...	...
(With Art. 34/18 Investment Funds)	(84)	(90)	(-)	(-)	(-)	(-)	...	...
(With Supplementary Funds)	(106)	(115)	(-)	(-)	(-)	(-)	...	...
Other Private Investment 6/	2,560	1,550	1,915	2,350	3,155	3,490	1.6	6.4

1/ Projected total fixed investment (1971-76) corresponds to an average ICOR (with one year lag) of 2.75 for the global Northeast economy as compared with an average ICOR (with one-year lag) of 3.0 during the four-year period 1966-69, prior to the drought of 1970.

2/ Projected federal fixed investment (1971-76) corresponds to direct investment by the Federal Government and federal autarkies plus PIN investment in irrigation and PROTERRA; all other projected federal transfers of investment resources to the Northeast are included either in state and municipal fixed investment (using resources from Participation Funds and [illegible] tax transfers) or in private investment (using Art. 34/18 investment funds or credit from official lending institutions).

3/ Projected fixed investment of states and municipalities (1971-7[illegible]) [illegible] on SUDENE's Development Plan for the the Northeast: 1972-74, supplemented by analyses of sector requirements in electricity (Eletrobras), water supply and sewerage (BNH), and transport and education (IBRD missions).

4/ The fixed investment in SUDENE approved projects (1966-71) is determined by assuming that disbursements of Art. 34/18 investment funds from the Bank of Northeast Brazil in a given year finance on the average 44 percent of the total project investment; this ratio of 34/18 funds to total investment in a project is projected to decline gradually to 30 percent by 1976 as SUDENE [illegible] project financing criteria in light of the increasing scarcity of 34/18 funds.

5/ "SUDENE-approved other investment", [illegible] agricultural sector, [illegible] after 1972 by investment financed through PROTERRA.

6/ The [illegible] contraction of other private investment from 1971 to 197[illegible] [illegible] result of [illegible] PIN and PROTERRA [illegible] federal investment although these programs will support private investment [illegible] in agriculture through credit and public investment [illegible] the [illegible] cost.

Sources: SUDENE; Bank of Northeast [illegible] from Ministry of Planning [illegible].

(ii) State and Municipal fixed investment, corresponding to the states and municipal sector investment programs as presented in the SUDENE plan 1/ and adjusted by the mission's own estimates of investment requirements for the implementation of the educational reform and for the carrying out of a program of state roads and municipal feeder roads.

As shown in the table above, in addition to the PIN and PROTERRA programs which have been analyzed in Chapter III (Sections A and B), federal investment in the Northeast will mainly consist of PETROBRAS' expenditures for exploitation of petroleum and natural gas, ELETROBRAS' expenditures for electric power projects, the Ministry of Transport's expenditures for the expansion and improvement of Northeast federal road network and, finally, the capital expenditures of the Ministry of Education in the Northeast.

196. These plans call for direct and indirect investment by the Federal Government and autarkies equivalent to about 11 percent of the projected value of gross regional product, as against roughly 6 percent during 1966-71. Thus, federal investment is expected to expand at an annual rate of 24 percent during 1972-76 as compared to 6.4 percent in the past quinquennium. Moreover, even disregarding the special programs such as PIN and PROTERRA, the investment expenditures in roads, electricity and the like are budgeted to expand at a rate of about 20 percent annually, much faster than the targeted expansion of overall economic activity. (See Table below.)

197. Public sector investment undertaken by the Northeast state governments and municipalities 2/, including autonomous entities and public enterprises, comprised an estimated average of 4 percent annually of gross regional product in the Northeast during the period 1966-71. Its rate of growth averaged somewhat less than 5 percent annually. 3/ The state public investment program is primarily financed out of federal transfers to state government budgets as well as capital transfers from the National Road Fund and the National Electrification Fund which go directly to state autarkies and state public enterprises. The ordinary budget revenues of the states do not cover current operating expenditures plus current transfers, and state autarkies as a group do not generate internal savings in the absence of transfers from the state budgets. Thus, in the period 1967-71 the state public sector relied on

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1/ SUDENE - Plano do Desenvolvimento do Nordeste, 1972-74.

2/ The operations and investment plans of the state governments and the municipalities have been consolidated for the purpose of this discussion. The term "state" is used here to designate this consolidation.

3/ Growth was all concentrated in the years prior to 1970 when ICM revenues plus transfers from the Federal Government were expanding. The level of state public sector investment is estimated to have declined in 1970 and 1971 below the peak reached in 1969 as a result of the stagnation of tax receipts and reduced transfers from the Federal Government.

federal transfers to cover the deficit on current operations and to finance more than 60 percent of total state public investment. The remainder of the state investment has been largely financed by borrowing from federal and state banks and to a limited extent, from foreign sources (including financial credits).

Table 22: DIRECT INVESTMENT BY THE FEDERAL GOVERNMENT AND FEDERAL AUTARKIES, 1972-76

(In Cr$ millions at constant 1971 values)

		Projection			
	1972	1973	1974	1975	1976
Total Direct Federal Investment	2,500	2,775	3,300	3,[illegible]	4,37[illegible]
Agriculture	242	278	320	37[illegible]	4[illegible]
Mining and Manufacturing Industries	765	800	1,010	1,152	1,336
Electricity	530	610	700	805	9[illegible]
Basic Sanitation	50	57	65	75	[illegible]
Transportation	305	351	402	462	53[illegible]
Roads	(261)	(300)	(344)	(396)	(456)
Railroads and Ports	(44)	(51)	(58)	(67)	(77)
Communications and Storage	73	84	96	110	127
Education	422	485	557	641	737
Health	87	100	115	132	152
Colonization and Community Development	15	18	21	24	2[illegible]
General	11	12	14	1[illegible]	20

Source: SUDENE and Ministry of Planning.

188. The projected state public investment program for the five-year period 1972-76 calls for a rapid expansion of activity at an average rate of 20 percent per year and is projected to comprise about 5.7 percent of gross regional product annually in the Northeast in those years. The state and municipal public sector investment by sector proposed for the Northeast is as follows:

(i) In agriculture, the state governments will contribute to research and experimentation programs designed to find new crop opportunities and to raise productivity in the sector. There will also be fixed investment in storage facilities. Nevertheless, investment in agriculture is projected to comprise less than 2 percent of the total state public sector investment program on the assumption that federal government programs (e.g., PROTERRA) will meet the public investment needs in this sector.

(ii) In the industrial sector (mining and manufacturing), state investment plans call for the enlargement of industrial parks in the Northeast and surveys of mineral resources, but less than 5 percent of total state public sector investment will be directed to these activities.

(iii) The investment program in electricity by state autarkies and state public enterprises in the Northeast is outlined in a five-year investment budget prepared by Eletrobras. Excluding the projects being undertaken by the San Francisco Hydroelectric Company (CHESF) and the Boa Esperanca Hydroelectric Company (COHEBE) with direct federal government involvement, seventeen other state electric companies in the Northeast are projected to make investments largely in transmission and distribution, which will represent about 15 percent annually of total state public sector investment.

(iv) Basic sanitation is the sector which is projected to absorb the largest share (approximately 30 percent annually) of total state public sector investment in the Northeast. The emphasis on basic sanitation is the result of the implementation of a National Sanitation Plan (PLANASA) under the auspices of the National Housing Bank (BNH) whereby state governments earmark 5 percent of their revenues, to be supplemented with loans from BNH, for investment in water supply and sewerage.

(v) Transportation is projected to absorb the second largest share (approximately 26 percent annually) of total state public sector investment. The state investment activity is almost exclusively concentrated in building and maintaining state roads, since ports and railway investments are generally planned and financed by federal autarkies. The state road investment requirements have been estimated on the basis of the detailed investment program contained in the 1969 Brazil Transport Survey. Municipal investment in feeder roads is also included.

(vi) Communications and storage are projected to absorb less than 2 percent annually of the total state public sector investment program. The planned investments involve the expansion of telephone service in Bahia and the installation of microwave transmission in other states of the Northeast, to be carried out by state public communications enterprises.

(vii) The projected state investment in education is based on an IBRD mission analysis of future requirements at the state level for the implementation of the public school educational reform in primary and secondary education.

The projected investment represents a large (almost threefold) increase over past levels of state public sector investment in education and in relation to the total investment program would rise from 7 percent in 1972 to 10 percent and higher in 1976 and beyond.

(viii) State public investment in health is projected to continue to comprise a very small portion (less than 2 percent) of the total investment program. The aim is consolidation of existing facilities which, at present, are not intensively utilized: ongoing projects will be completed and a number of hospitals properly equipped.

(ix) Investment in tourism is projected to be minuscule on the part of the state public sector, on the assumption that the private sector will dominate the activity in this area.

(x) General investment in buildings and equipment is projected to grow at 11 percent per annum, corresponding to the increasingly important role to be occupied by public administration at the state government level in an economy expanding at an average rate of 10 percent or more per annum.

Private Sector Investment

189. Expansion of private sector investment will be essential to sustain the rapid growth which is targeted for the Northeast economy. As in the past, most of the private investment will take place in manufacturing. Assuming a 2.0 capital-output ratio, the investment required to sustain a manufacturing production expansion of 15 percent annually is on the order of Cr$12.5 billion (or US$2.4 billion) during 1972-76. In the immediately preceeding quinquennium, investment in 34/18 industrial projects amounted to about Cr$5 billion.

190. Whether or not this increase of private investment in industry can be achieved in view of the cutback in the Article 34/18 resources available for industry is one of the principal uncertainties associated with the feasibility of the overall investment requirements for 10 percent regional growth.

C. Resource Availability

191. Following the diversion of 34/18 funds to finance the Amazon road and colonization project, there is a growing concern in the Northeast about the outlook for resources mobilized outside the region to support private investment in the Northeast. At this juncture, it is necessary to assess the likelihood that the overall investment requirements of the growth strategy for the Northeast will be met. To make this assessment, resource availability for the three main components of Northeast investment (i.e., federal, state and private investment) will be examined. These pieces will first be considered separately and then incorporated into an integrated framework.

Table 23: NORTHEAST BRAZIL - STATE AND MUNICIPAL PUBLIC INVESTMENT: 1967-76

(In Cr$ millions at constant 1971 values)

	Actual			Estimated		Projections				
	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
State and Municipal Public Investment[1/]	795	1,215	1,237	1,125	1,148	1,855	2,180	2,341	2,619	2,868
Agriculture	25	31	29	...	...	30	33	32	35	35
Mining and Manufacturing Industries	18	45	13	...	...	75	56	56	65	80
Electricity	97	146	150	...	...	280	250	265	275	260
Basic Sanitation	60	79	101	...	...	370	537	590	643	750
Transportation	250	414	375	...	...	475	568	598	707	800
Roads	(242)	(410)	(358)	(...)	(...)	(462)	(552)	(579)	(685)	(779)
Railroads and Ports	(3)	(2)	(11)	(...)	(...)	(3)	(4)	(5)	(5)	(6)
Other	(5)	(2)	(6)	(...)	(...)	(10)	(12)	(14)	(17)	(20)
Communications and Storage	15	13	58	...	...	24	24	31	30	30
Education	35	38	44	...	...	110	130	157	185	220
Health	11	12	10	...	...	17	20	24	29	34
Tourism	-	-	-	...	...	10	10	10	10	10
General (Buildings and Equipment)	278	437	457	...	...	464	522	578	643	714

(i) Actual figures (1967-69) for state and municipal public investment according to SUDENE, Assessoria Tecnica: "Informe sobre Formacao de Capital Fixo do Setor Publico do Nordeste, 1960-69", (Recife, April 1971).

(ii) Projections (1972-74) are according to SUDENE, "Plano de Desenvolvimento do Nordeste: 1972-74" (August 1971) and other sector investment plans as cited below; projections (1975-76) are based on findings of the IBRD mission:

(a) Agriculture: SUDENE (1972-74) plus no projected increase after 1975 on the assumption that Federal Government programs will meet the public investment needs in this sector;

(b) Mining and manufacturing industries: SUDENE (1972-74) plus constant level after 5 for continuation of mineral exploration and enlargement of industrial parks;

(c) Electricity: Eletrobras Pluriannual Investment Budget (1972-75) followed by accelerated growth of state investment after 1975 in order to extend transmission lines to rural areas;

(d) Basic Sanitation: SUDENE (1972-74) followed by investment growth by 9 percent per annum in accordance with National Housing Bank (BNH) estimates of investment needs to furnish water and sewerage to 80 percent of the urban population by 1980;

(e) Transportation: the amount and growth of investment in roads (1972-80) has been determined as a function of the earmarked transfers of federal tax revenue (IUCL) to the state road agencies and taking into consideration a feeder road program to be financed in part by the BNDE and foreign development loans; as for railroads and ports, no major new state investment is projected, which implies that the state of Pernambuco does not construct a new port linked to a new industrial park outside of Recife; other transportation investment is linked to urban public transit and will rise by 20 percent annually;

(f) Communications and storage: SUDENE (1972-74) followed by a constant level of state investment pro rata thereafter on the assumption that federal and private investment will meet the growing needs;

(g) Education: projected investment (1972-76) based on IBRD mission analysis of requirements at the state level for the implementation of the public school educational reform for primary and secondary education (see Adams, D., and Tsantis, A., "The Education and Training System of Northeast Brazil" - mimeograph, July 1972);

(h) Health: SUDENE (1972-74) followed by a continuation of the trend rate of growth at 20 percent per year;

(i) Tourism: SUDENE (1972-74) followed by a constant level of investment thereafter;

(j) General: projected investment (1972-80) based on a trend rate of growth at 11 percent per annum in accordance with the needs of state government in an economy expanding at an average rate of 10.5 percent per annum during the same period.

Source: SUDENE; Ministry of Planning; Eletrobras; National Housing Bank; National Development Bank; and IBRD mission findings.

Resources for Federal Investment

192. Among the various components of Northeast investment, federal investment is probably the only one which is likely not to suffer from lack of resources. The overall analysis of financing of federal investment in the Northeast as well as in the rest of the country will be developed in the Main Report. Here it is enough to mention that the expected volume of federal savings and net external loans in 1972-76 will be sufficient to meet the financing needs of federal investment in the Northeast as well as in the rest of the country, as outlined in the pluriannual investment budget. If slippages in federal Northeast investment occur, the cause will be hardly of a financial nature. It will rather reside in delays in project preparation and implementation.

Resources for State Investment

193. The prospects for an expansion of investment by Northeast States in the next few years are predicated on increased federal government transfers, on stricter expenditure control as well as an improvement and changes in the state value-added tax (ICM) administration.

194. Most of the Northeast states are not able to meet their current expenditures from their tax revenues. Federal transfers play an important role in the financing of their current and capital expenditures. About 95 percent of the state tax revenues are derived from a valueadded tax called ICM. The ICM was introduced in 1967, in place of a cascadetype sales tax. Although it was foreseen at the time of the reform that the Northeast states might suffer a decline in revenues, ICM collections recorded an annual real increase of 15 percent between 1966 (the last year of the old tax) and 1969. In 1970 and 1971, however, a decline in the economic activity related to the drought led to a slight real drop in ICM revenues. Another factor in the poor revenue performance in 1971 was the beginning of a series of annual reductions in the ICM tax rate from 13 percent in 1970 to 16 percent by 1974. This downward adjustment in the incidence of the ICM was conceived by the Federal Government to offset the contribution by firms to the newly created Social Integration Program (PIS). Whether the loss of revenues to Northeastern states resulting from this measure will be compensated by allocation of PIS resources in the region remains to be seen. Faced with declining revenues and mounting current expenditure, the states have increasingly resorted to short- and medium-term borrowing from domestic and, to a lesser extent, external sources.

195. Any projection of the revenue performance to be anticipated for the Northeast states during the decade of the 1970's must necessarily concentrate on the overwhelmingly important state value-added tax (ICM). The limited historical experience with this tax in the Northeast suggests that approximately one-third of total value-added in all sectors of the regional economy is effectively subject to the ICM levy. A number of factors limit the effective incidence of this tax. First, it is impossible to apply the tax to value-added imputed to subsistence production. Second, administrative constraints make it impractical to impose the tax on the unorganized service sector. Third, many categories of goods are exempted from the ICM tax. These

include: basic food-stuffs (to mitigate the regressive element of the tax); manufactures exported abroad (to permit the product to be competitive in international markets); and products of enterprises newly established in the Northeast in accordance with guidelines set by SUDENE.

196. Whereas the first two types of statutory exemptions mentioned above apply fairly uniformly throughout Brazil, the special exemptions made available to newly established manufacturing industry are most concentrated in the Northeast states. As mentioned above, most of the states in the Northeast allow firms to deduct up to 60 percent of their ICM liability to the state, provided the sum deducted is applied to new or expanded investment in the state for a period of 5 years. The effect of these deductions reinforces that of the 34/18 incentive in permitting a firm locating in the Northeast to effectively underprice competition from outside the region (especially from the Southeast and South) which is subject to a uniform ICM levy on interstate trade. In addition, however, competition among the Northeast states themselves to attract industry within their borders has led to a certain amount of wildcat bargaining between states and particular investors which has resulted in additional deductions or total exemption being granted. 1/ In the case of one Northeast state which has attempted to evaluate the loss of revenue due both to the uniform ICM exemptions associated with the Article 34/18 scheme plus additional exemptions granted by that state, it was determined that by 1970 these exemptions were equivalent to 10 percent of actual ICM collections.

197. For the purpose of projecting ICM revenues for the state governments of the Northeast, the proportion of regional product which will actually be subject to the ICM tax is assumed to increase from 31 percent in 1972 to 41 percent by 1976. Projected improvement of the effective ICM tax base assumes that an increasing proportion of regional product will be included in the monetized sector and that there will be some improvement in tax administration by the state governments. To a certain extent, this expansion of the tax base will be offset by the reduction from 17 percent in 1970 to 15 percent in 1974 of the rate of the ICM tax associated with the installation of the PIS (see para. 194 above). The net result is that ICM revenues are projected to grow in real terms by about 11.4 percent annually if the 10 percent growth targets of the regional economy are achieved.

198. State current expenditures are projected to increase in real terms by 10 percent per year. This compares with an average increase of 11 percent in 1967-71. The projections reflect (a) an increase in recurrent education

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1/ In an effort to prevent firms from exploiting the rivalry between the states and further eroding their ICM tax base, the Ministry of Finance of the Federal Government has organized a council of the secretaries of finance of all the state governments, and no new deductions or exemptions from the ICM may be granted by any state without the approval of at least three-quarters of the membership of the council. However, this regulation does not apply retroactively; therefore, any previously existing deductions and/or exemptions from the ICM liability remain in effect.

expenditures by 11 percent in the light of expected enrollment growth stemming from the educational reform; (b) an 8 percent annual increase in wage and salaries (other than education) in the light of requirements for trained personnel for development; and (c) an 11 percent increase in purchases of goods and services, to support the expansion of minimum social service standards required by the growing population. Clearly, there is opportunity for some economies, particularly in the (b) area.

199. If Northeast state and municipal revenues and current expenditures grow along the lines suggested in the preceding paragraphs, the resulting current account deficit (before transfers received) will grow from Cr$625 million in 1971 to Cr$824 million in 1976. But, due to a higher growth rate of revenues (11.5 percent) vis-a-vis expenditures (10 percent), the current account deficit as a percentage of current expenditures will decline from 25 in 1971 to 21 percent in 1976. This represents an improvement in the fiscal performance of states and municipalities.

200. The 1967 tax reform, which created the ICM, abolished all earmarking of federal budgetary revenues for specific expenditures, with the exception of the various sale taxes: i.e., the petroleum tax (IUCL), the electric power tax (IUEE) and the minerals tax (IUM). At the same time, it reduced the share of states and municipalities in the IUCL from 60 percent to 40 percent. These changes were more than offset, however, by the other major innovation of the reform, the introduction of tax sharing in the form of the Participation Fund, whereby states and municipalities receive -- in equal parts -- 20 percent of the federal income tax and industrialized products tax (IPI). In 1969, this share was reduced to 10 percent while a Special Fund was created to distribute an additional 2 percent, particularly to poorer states. The sudden decline from 20 percent to 12 percent in the tax sharing mechanism is explained by fiscal difficulties encountered by the Federal Government in that year, as well as by the unexpectedly good revenue yield from the ICM since its introduction in 1967. This system is still prevailing. It has a strong redistributive effect owing to the need element built into the formula for Participation and Special Fund distribution. The Northeast generates about 6 percent of federal income tax and IPI revenues and, therefore, the same percentage of total resources available to the two Funds. It receives, on the other hand, some 40 percent of total Fund transfers. In the case of earmarked federal taxes, such as IUCL, IUEE and IUM, the redistributive element is marginal. At present, about 33 percent of all federal revenue sharing with states and municipalities is allocated to the Northeast, while its contribution to the shared revenues is about 7 percent.

201. Under the present revenue-sharing system, federal transfers to Northeast states and municipalities will grow at an annual rate of 12.3 percent, faster than the expected Brazilian GDP. This is due to the fact that the shared federal taxes (such as income tax, IPI, etc.) are characterized by fairly high elasticity to changes in nominal GDP. Thus, federal transfers and current state revenues together are going to more than offset current state expenditures. State and municipalities' savings (after transfers) are, therefore, projected to increase at about 17 percent annually. They would finance, on average, 49 percent of projected estate investment, as against

65 percent in the past quinquennium. In addition, the states should be able to borrow domestically a part of the resources needed. From the official banking system (BNH, BNDE, BNB) they are expected to borrow about Cr$2,360 million, corresponding to about 20 percent of the total investment program. Finally, for the next five years, the financing projection envisages an external capital inflow of Cr$224 million, based on loans from the IBRD, the IDB and the USAID that have been already approved or are included in their present lending programs.

202. Under the assumptions discussed above, the states would confront an unfinanced gap of about Cr$3.3 billion. It is expected that, with some further effort on project preparation, roughly Cr$300 million may come from disbursements on external loans still to be included in the lending program of the development agencies, in the field of sewerage, education and feeder roads. Thus, a residual internal gap of about Cr$3.0 billion could emerge.

Finding More Resources for the Northeast States

203. The projected savings gap for the state public sector in the Northeast can be reduced by increasing the transfers from the Federal Government to the Northeast states and/or by broadening the tax base of the ICM in the Northeast. Both of these possibilities merit serious consideration in view of the need for a high level of state investment both for productive and social purposes. One issue that has been the focus of much debate concerns the alleged bias in favor of richer states that results from applying the ICM at the origin of production rather than at the destination or point of sale. The choice of the origin principle for the ICM was largely determined by administrative considerations; it is easier to collect a large portion of the tax revenue from a relatively small number of major producers instead of having to cover a much larger number of retail distributors (as would be necessary under the destination principle) in order to collect the same amount of revenue. Nevertheless, the origin principle of ICM levy creates a situation whereby goods are subject to the tax at the point of production and, when sold to a consumer outside of the producing state, the price of the good includes the amount of tax paid at the origin of production. Thus, the final consumer outside the producer state bears the burden of the tax which is collected by the producer state. 1/

204. The Northeast states have become increasingly a net importing region. Northeast exports to the rest of Brazil as a percentage of regional domestic product fell steadily from about 12 percent at the beginning of the 1960's to less than 6 percent by 1968, the last year for which fairly complete information is available. Meanwhile, Northeast imports from the rest of Brazil as a percentage of regional domestic product have tended to fluctuate in a range from 14 percent to 21 percent. Thus, the interregional trade deficit

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1/ The inverse would prevail under the destination principle of ICM application, in which case the tax revenue would be retained by the state where a product was sold even though the value-added in the production process had largely been carried out in another state

Table 24: STATE AND MUNICIPAL FINANCES: 1967-76

(In CrS millions at constant 1971 values)

	Actual			Estimate		Projection					Total	Total	Ratio
	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1967-71	1972-76	(B)/(A)
State and Municipal Revenues	1,400	1,610	1,818	1,730	1,830	2,214	2,361	2,510	2,816	3,161	8,388	13,062	1.56
State Budget Revenue	983	1,143	1,295	1,232	1,300	1,590	1,690	1,788	2,012	2,263			
ICM Revenue	(959)	(1,093)	(1,255)	(1,166)	(1,212)	(1,494)	(1,584)	(1,674)	(1,888)	(2,128)			
Other Taxes and Fees	(24)	(50)	(40)	(66)	(88)	(96)	(106)	(114)	(124)	(135)			
Municipal Budget Revenue	417	467	523	498	530	624	671	722	804	898			
ICM Revenue	(240)	(273)	(315)	(292)	(303)	(374)	(396)	(420)	(472)	(532)			
Other Taxes and Fees	(177)	(194)	(208)	(206)	(227)	(250)	(275)	(302)	(332)	(366)			
State and Municipal Current Expenditures	1,614	2,010	2,139	2,160	2,455	2,723	2,994	3,295	3,626	3,985	10,378	16,623	1.60
State Current Expenditures	1,144	1,425	1,516	1,531	1,740	1,930	2,122	2,335	2,570	2,825			
Municipal Currend Expenditure	470	585	623	629	715	793	872	960	1,056	1,160			
Current Budget Deficit	-214	-400	-321	-430	-625	-509	-633	-785	-810	-824	-1,990	-3,561	1.79
State Current Budget Deficit	-161	-282	-221	-299	-440	-340	-432	-547	-558	-562			
Municipal Current Budget Deficit	-53	-118	-100	-131	-185	-169	-201	-238	-252	-262			
Total Federal Transfers to States and Municipalities	762	1,329	1,066	1,156	1,250	1,485	1,685	1,811	2,003	2,217	5,563	9,201	1.65
Transfers to States	493	824	759	814	890	1,074	1,217	1,315	1,455	1,613			
Transfers to Municipalities	269	505	307	342	360	411	468	496	548	604			
Total State and Municipal Investment Financing	795	1,215	1,237	1,125	1,148	1,855	2,180	2,341	2,618	2,868	5,520	11,862	2.15
Savings after Federal Transfers	548	929	745	726	625	976	1,052	1,026	1,193	1,393	3,573	5,640	1.58
External Borrowing (Net)	31	40	45	34	33	78	88	158	100	100	183	524	
Domestic Borrowing (Net)	216	246	447	365	490	345	486	487	506	536	1,764	2,360	
Bank of Northeast Brazil (BNB)	(...)	(...)	(...)	(...)	(...)	(10)	(15)	(20)	(25)	(30)			
National Development Bank (BNDE)	(...)	(...)	(...)	(...)	(...)	(43)	(58)	(58)	(50)	(50)			
National Housing Bank (BNH)	(...)	(...)	(...)	(...)	(...)	(292)	(413)	(409)	(431)	(456)			
Other	(...)	(...)	(...)	(...)	(...)	(...)	(...)	(...)	(...)	(...)			
Unfinanced Gap	-	-	-	-	-	456	554	670	819	839	-	3,338	

Source: Ministry of Finance (Subsecretariat of Economy and Finance); Ministry of Planning; SUDENE; Bank of Northeast Brazil; National Housing Bank; IBRD mission estimates.

of the Northeast with the rest of the country grew from the equivalent of 6 percent of NE-regional product in 1964 to 16 percent in 1968. By 1972, it is estimated to have risen to about 20 percent.

205. Considering that about 65 percent of this trade presently is subject to ICM taxation by the state of origin at an average rate of 14.5 percent -- the remainder being constituted by capital goods which, since 1979, have been free -- the Northeast probably has made a net Cr$600 million in ICM tax payments to states elsewhere in the country in 1972.

206. In order to counteract this revenue effect of interregional trade, it has been suggested that the ICM tax revenues generated by it be split equally between the exporting state and the importing state. Such an arrangement would be a compromise between the origin principle and the destination principle of application of the ICM. It would yield Cr$300 million to the Northeast, corresponding to about 20 percent of its ICM revenues in 1972.

207. The adoption of an equal sharing arrangement for ICM revenues from interstate traded goods would have widely differing effects in various Northeast states. For example, Pernambuco, the most industrialized state in the Northeast, would receive the smallest benefit, with an increase of ICM revenue of at best 10 percent. On the other hand, states in which primary production comprises the major part of economic activity, such as in Piaui, the potential increase in ICM revenue could reach 35 percent. Of course, if the states in the Northeast as well as other "consumer" states in Brazil would benefit from the adoption of an equal sharing of ICM revenue on items entering interstate trade, the gain would be at the expense of the "producer" states such as Sao Paulo. Had equal sharing been in effect in 1968, about 8.9% of the ICM revenues actually collected by Sao Paulo would have been lost to that state. Moreover, the bulk of these revenues would not have been shifted to the Northeast states but rather to the more affluent states in the Center-South which are Sao Paulo's principal trading partners. Under present trading patterns only about 13 percent of the benefit from splitting Sao Paulo's ICM revenues from interstate sales with that state's trading partners would accrue to the Northeast.

208. The Sao Paulo example is representative of the overall effect likely to result from ICM splitting, inasmuch as interstate trade within the Center-South region comprises the predominant portion (68 percent in 1968) of all interstate trade in Brazil. Thus ICM splitting might well prove to be a very inefficient way to responding to the revenue needs of the Northeast: (i) the bulk of its revenue impact and of the resource allocating effects of that impact would be felt outside the Northeast; and (ii) it would respond in a very uneven way to the needs of individual states even within the Northeast.

209. Clearly, mobilization of investment resources for the Northeast should be approached in the widest possible context. As discussed in para. 202, the Northeast states are going to be faced with a financing gap on the order of Cr$3,300 million if the proposed investment program is carried out.

One way to eliminate the gap would be rescheduling investment plans so as to yield a more gradual rate of increase in state investment. But this would be contrary to the policy target of a rapid growth of the Northeast as well as of an improvement in social services. The interregional transfer of resources which is implied by existing government plans already represents a major effort in mobilizing resources through interregional transfers. But probably it is not sufficient if the above-mentioned objectives are to be met in this decade. Any additional transfer of resources whether federal or state to the Northeast will be either directly or indirectly at the expense of the other states. Transferring state resources through a change in the ICM system will probably be unfeasible from an administrative and political standpoint. Transfer of federal resources, on the other hand, may be easily implemented through an increase of the percentage of the federal tax revenues which constitute the Special Fund, under the revenue sharing system.

210. The advocates of the richer states, such as Sao Paulo, argue that a reduction of resource availability for investment in the Center-South would impair the rate of growth of the overall Brazilian economy and, in turn, absorption by the Center-South of Northeast surplus labor as well as Center-South resource transfer to the Northeast. Their argument is based on the assumption of higher productivity of capital in the Center-South than in the Northeast, which still must be demonstrated, as already discussed in para. 181 above. But even assuming that a productivity differential exists, it must be recalled that the additional interregional transfer suggested here is marginal for the Center-South economy, but substantial for the Northeast. The purpose of the transfer is to improve the relative availability of public services provided by the Northeast states. As late as 1969, public sector investment in the Northeast (including 34/18 funds) was, in per capita terms, still about half the corresponding figure for the rest of the country.

211. To accomplish the objective of redistributing tax resources from the richer states to the poorer states, the allocation of federal revenues from the income tax and IPI to the Special Fund could be revised from the present 2 percent to 6 percent. If the present distribution among the states is maintained (70 percent to the Northeast and the remaining 30 percent to the North and Espirito Santo), this measure would provide the Cr$3 billion of additional resources to the Northeast states which appear to be needed to cover the gap in the financing of their investment program. This would correspond to diverting to the Northeast an additional 1.7 percent of federal tax revenues annually. The impact of such policy change on federal finances is evaluated in the main report. There, it is concluded that, in the context of the expected federal budget situation, such a transfer appears to be well within the fiscal capabilities of Brazil.

Resources for Private Investment

212. The amount of resources available for private investment in the Northeast in the next few years is essentially predicated upon the flow of 34/18 funds and the expansion of credit by the regional banking system, mainly the Bank of the Northeast and the Bank of Brazil.

Table 25: TRANSFER OF FUNDS TO THE NORTHEAST REGION THROUGH TAX INCENTIVES FOR JURIDICAL PERSONS

	Actual			Estimated	Projection				
	1967	1969	1970	1971	1972	1973	1974	1975	1976
Total Income Tax Declared	2,958	3,457	3,971	4,370	4,795	5,260	5,770	6,330	6,945
Deductions for All Incentives	1,162	1,689	1,992	2,095	2,369	2,525	2,770	3,040	3,333
Deductions for Northeast	796	952	1,075	950	1,124	1,212	1,307	1,413	1,527
34/18 Investment Funds	(796)	(952)	(1,035)	(778)	(575)	(631)	(692)	(760)	(833)
PROTERRA	(-)	(-)	(-)	(-)	(322)	(354)	(388)	(426)	(467)
PIN-Irrigation	(-)	(-)	(-)	(72)	(227)	(227)	(227)	(227)	(227)

Source: See Appendix Table

213. As a result of the allocation of 50 percent of 34/18 funds for the PIN and PROTERRA programs, the future accrual of 34/18 funds available for private investment will be substantially lower than in the recent past, despite the expected rapid increase in corporate income tax revenues which constitute the basis of the 34/18 funds. As shown in the table below, even assuming a 9.7 annual increase in total corporate income tax declared and some improvement in the share of the incentives going to the Northeast (from the exceptionally low 41 percent in 1971 to an average 49 percent in 1972-76), the annual average accrual of private 34/18 funds is expected to be around Cr$700 million in 1972-76, as compared to about Cr$915 million in 1968-71. Including an undisbursed balance of Cr$900 million at the end of 1971, total availability of 34/18 funds during 1972-76 should amount to Cr$4.4 billion. If no change is introduced into the system, 34/18 funds for manufacturing would amount only to Cr$3.5 billion, after deducting the historical 20 percent for other uses (mainly agriculture).

214. As discussed in Chapter IV, manufacturing investment requirements in 1972-76 are in the order of Cr$12.5 billion (or US$2.4 billion) during 1972-76. Extrapolating the financing pattern that has prevailed in the recent past, 34/18 funds should provide about Cr$6.1 billion and the rest would come from the firms' own resources (Cr$2.7 billion), official banks (Cr$2.2 billion) and foreign financing (Cr$1.5 billion).

Table 26: REQUIREMENTS AND AVAILABILITY OF 34/18 FUNDS FOR MANUFACTURING INVESTMENT, 1972-76
(According to present system)

(In 1971 Cr$ billion)

34/18 Requirements	6.1
Projects approved through 1971	1.4
New projects	4.7
34/18 Availability	3.5
Balance End-1971	0.9
New Deposits 1972-76	3.5
Funds for other sectors	-0.9
Deficit	2.6
Financing of Deficit	2.6
All 34/18 funds to industry	0.9
Reduction in share of 34/18 financing	1.7

215. Since the 34/18 funds that will be available for manufacturing investment are expected to total Cr$3.5 billion, a financial gap of Cr$2.6 billion is likely to emerge unless there is a change in the pattern of industrial investment finance. The gap can be reduced to Cr$1.7 billion if agricultural projects are excluded from the 34/18 scheme and instead financed with loan capital through the PROTERRA mechanism. The remaining Cr$1.7 billion gap

would disappear if the average share of 34/18 funds in new project financing is reduced from the present 48 percent to about 30 percent. This could be achieved by reducing the share of 34/18 funds permitted to a project from a maximum of 75 percent to a maximum of 50 percent. Thus, the minimum "own resources" investment in 34/18 projects would be increased from the present 12.5 percent to 25 percent. Given the tight financial situation that BNB is likely to be confronted with, it is difficult to envisage an increase in the share of official banks in total financing. Therefore, sponsors' average contribution to new projects are likely to have to rise from 25 percent to 40 percent in order to make up for the reduction in the participation of 34/18 funds suggested here. Thus, the financing pattern of manufacturing investment during 1972-76 would be the following:

Table 27: FINANCING OF MANUFACTURING INVESTMENT, 1972-76
(according to proposed system)

(In 1971 Cr$ billion)

		Percentage Composition
Investment requirements	14.2	100
34/18 Funds	4.7	35
Firms' Own Resources	4.4	35
Official Banks	2.2	17
Foreign Financing	1.9	13

216. It is hard to assess whether the resulting increase in the cost of capital for Northeastern projects would negatively affect the flow of industrial investment in the Northeast. It could be argued that the increased cost of capital is likely to be offset, at least partially, by continued improvement in infrastructure and external economies in the Northeast industrial environment. Although the capital subsidy of the 34/18 scheme, albeit curtailed, together with IPI tax deductions and favorable loan financing in the Northeast should continue to attract investors, the alternative investment tax credits (e.g., Amazon, forestry, fishing, etc.) competing with the Art. 34/18 scheme for the Northeast become more attractive if similar changes are not implemented in their respective point systems for the use of subsidized capital.

The Bank of the Northeast

217. The Bank of Northeast Brazil (BNB) and the Bank of Brazil (BB) have played a major role in providing credit to the Northeast economy. Their combined loan portfolio accounted for 55 percent of outstanding loans from the banking system in the Northeast at the end of 1970: 25 and 30 percent of the total, respectively. Although the loan portfolio of the BB has been larger than that of the BNB, the latter has been the more important of the two institutions in terms of applying in the Northeast loanable funds acquired elsewhere in Brazil. This aspect of the BNB's lending operations has arisen in connection with the 34/18 investment tax credit mechanism. When a firm elects

the option of deducting up to 50 percent of its federal income tax liability for investment in the Northeast under this scheme, the deductible funds are deposited in a blocked account in the BNB pending the clearance with SUDENE of the utilization of the funds is an approved investment project. The lag that has existed in the past between the accrual of 34/18 investment funds as deposits in the BNB and the release of the funds for projects approved by SUDENE led to a substantial "float" in the BNB, which has been an important source of financing for its lending operations. The 34/18 investment tax credit funds held on deposit in the BNB accounted for slightly more than half of the BNB's resources of loanable funds in 1969 and 1970.

Table 28: BANK OF NORTHEAST BRAZIL - COMPOSITION OF OUTSTANDING LIABILITIES

(In Cr$ millions at constant 1971 values and percent)

	Dec. 31, 1969		Dec. 31, 1970		Dec. 31, 1971	
	Amount	%	Amount	%	Amount	%
TOTAL	2,200	100.00	2,292	100.00	2,141	100.00
Capital and Reserves	434	19.7	455	19.8	550	25.7
34/18 Deposits	1,245	56.6	1,192	52.0	914	42.7
Demand Deposits	222	10.1	320	14.0	274	12.8
Other Deposits	2	0.1	11	0.5	32	1.5
Foreign Borrowings	150	6.8	195	8.5	208	9.7
Domestic Borrowings	19	0.9	19	0.8	78	3.6
Other	128	5.8	100	4.4	85	4.0

Source: Bank of Northeast Brazil.

218. On the asset side, short term commercial credit mainly for urban marketing and working capital accounts for about one-half of the BNB's loan portfolio, agricultural credit for another 30 percent and manufacturing investment credit for the remaining 20 percent. Disbursements from BNB industrial loans during 1969-71 were equivalent to only about 4.5 percent of SUDENE-approved manufacturing investment. This compares with an average 18 percent share of borrowed funds in the financing of the SUDENE projects in that period. Uncertainty about the term of the Article 34/18 "float" partly explains the concentration of the BNB's portfolio in short term operations. However, even with this restraint, the BNB portfolio could and should have been more development oriented.

219. In any event, the level of BNB lending operations has stagnated in the last two years, mainly as a consequence of a sharp decline in 34/18 deposits brought about by the introduction of the PIS, which preempted 30 percent of new 34/18 funds and by the increased pace of withdrawal of 34/18 funds already deposited in the BNB in connection with SUDENE-approved investments.

Table 29: BANK OF NORTHEAST BRAZIL - PROJECTED ACCRUAL AND DISBURSEMENT OF 34/18 INVESTMENT FUNDS

(In 1971 Cr$ millions)

	Actual	Projected				
	1971	1972	1973	1974	1975	1976
Accrual of 34/18 Deposits	778	575	631	692	760	833
Drawdown of 34/18 Deposits	-854	-1,000	-953	-850	-700	-700
Net Change	-76	-425	-319	-158	60	133
Balance at end of Year	914	489	170	12	72	205

220. The 20 percent of 34/18 accruals allocated to PROTERRA will be deposited with the BNB until disbursed for activities incorporated in this program. Moreover, some of these resources will be allocated to BNB for lending to the agricultural sector and thus constitute a sort of revolving fund. Nevertheless, BNB will still need substantial additional resources in order to expand credit at the same pace as in the 1960's. One way to raise new resources is to increase share capital. This possibility has been already exploited by BNB in late 1972, with an increase of capital resources of Cr$140 million. This is reflected in the projections covering BNB sources and uses of funds through 1976 shown in the Table below.

221. The BNB is also making efforts to capture substantial amounts of new demand deposits, though the prospect for a significant increase in resources on this account is limited by the intense competition with commercial banks. A notional annual increase of Cr$40 million in demand deposits is incorporated in the resource projections, as the larger increases in the past were strictly related to the growth of 34/18 deposits.

222. Easier access to the official banking system (BNH, BNDE, PIS) through rediscount lines is likely to provide a new source of additional funds, but, unless there is a change in government monetary policy, it is unlikely that these rediscount facilities will be sufficient to permit BNB to substantially expand its lending operations. Our projection of Cr$50 million annual average increases in borrowing from official institutions reflects present policy.

223. In the five-year period 1972-76, BNB will drawdown the entire US$35 million undisbursed balance of external development agency loans outstanding as of end-1971. The BNB appears to be somewhat reluctant to contract new external credits. Its management realizes that increased reliance on normally priced resources relative to the free 34/18 deposits will have a negative effect on profitability. Thus great care is being exercized in mobilizing alternative resources at minimum cost.

224. If no new foreign borrowing is contracted in the next five years and there are no additional federal allocations (either directly or through official banks) to BNB, the prospects for BNB lending are bleak, particularly in 1972-74. In those years, the impact of 34/18 deposit contraction on available resources will be felt the most. The situation will improve in 1975 and 1976, when the balance of 34/18 deposits will start growing again. But, even as late as 1976, sources of loanable funds will be virtually equal to 1969. As to the sectoral composition of lending, despite the difficult financial situation, agricultural loans are expected to increase rapidly as they are tied to projected PROTERRA allocations to BNB. But, industrial loans outstanding must be substantially curtailed through 1974, even if short-term and other operations are sharply reduced.

Table 30: BNB - SOURCES AND USES OF FUNDS, 1969-76

(In 1971 Cr$ million)

(On the assumption of no additional foreign loans or government contribution)

	Actual			Projection				
	1969	1970	1971	1972	1973	1974	1975	1976
Sources (Net Annual Flow)	540	526	243	105	96	264	411	575
Capital and Reserves	126	146	149	230	100	110	121	135
34/18 Deposits	276	153	-77	-425	-319	-158	60	133
Demand Deposits	36	135	7	40	40	40	40	40
Other Domestic Borrowing/1	44	22	118	50	50	50	50	50
Foreign Borrowing	58	70	46	50	50	30	-10	-15
PROTERRA Funds	-	-	-	160	175	192	210	232
Uses (Net Annual Flow)	540	526	243	105	96	264	471	575
Industrial Credit	134	-26	-17	-80	-109	-13	161	228
Rural Credit	72	43	102	160	175	192	210	232
Short-term Credit	174	416	64	-	-	50	60	70
Other	160	93	94	25	30	35	40	45

/1 Mainly rediscount lines.

225. If BNB were to maintain its share in Northeast industrial lending (i.e., financing about 5 percent of SUDENE-approved projects) it would need an additional Cr$200 million during 1972-76. This would allow BNB to increase industrial loan disbursements from an annual average of Cr$54 million during 1969-71 to Cr$125 million during 1972-76. Since BNB needs for foreign exchange resources to finance the estimated 15 percent direct import

component of projects have been estimated at US$50 million during 1972-76, against an undisbursed balance of IBRD loan of US$20 million at the end of 1971, there is a foreign exchange gap of US$30 million, corresponding to about Cr$150 million. Thus, a new loan by a development agency for such amount plus an additional government contribution of about Cr$50 million may be sufficient to assure a minimum growth to BNB's industrial portfolio.

226. If, on the other hand, the BNB were to play a greater role in Northeast development, resources additional of those mentioned above would be required. This is especially true because of the likelihood that demand for borrowed funds to finance Northeast industrial expansion will rise with the decreased availability of 34/18 resources for industry. In the case of major projects, such as the Bahia petrochemical complex, BNDE will supply adequate financing. But for medium and small industries, BNB remains the only source of long-term financing. If the access to this "window" is limited because of BNB's lack of resources, these weaker entrepreneurs are likely to have recourse to harder loans from commercial banks or suppliers. As it has occurred in the past, this can seriously jeopardize the financial viability of new ventures. In addition, BNB could provide technical assistance and screening of projects through careful project appraisal. To perform the functions of a development bank, however, it needs not only additional resources but also to adopt a more aggressive lending policy, including, possibly, relaxation of collateral requirements.

Overall Financing of Northeast Investment

227. The table below sets forth the projected financing plan for the 1972-76 Northeast investment program resulting from the consolidation of the financing patterns for federal, state and private investment presented in para. 192-226 above.

228. Implementation of Northeast investment is predicated on heavier reliance on federal resource mobilization than in the past five years. Assuming no change in the present revenue-sharing system, the federal contribution to the financing of Northeast investment would average about 55 percent of total investment expenditures, as against an estimated 45-50 percent in 1967-71, when investment levels were about 44 percent lower than in the proposed 1972-76 investment program. Federal transfers to states and municipalities will much more than offset the dissavings (before transfers) of local governments which are expected to average about 6 percent of total investment.

229. The 1972-76 investment financing projection also envisages a gross external capital inflow of some Cr$2.3 billion (US$432 million equivalent) that is expected to be associated with project financing by development agencies. About one-third of this amount, or US$155 million consists of draw-downs on existing loans. The rest (US$277 million) would have to come from loans still to be contracted, but which are included in the present lending programs of the development agencies. This level of disbursements would call for commitments of about US$350 million over the

Table 31: FINANCING OF NORTHEAST INVESTMENT, 1972-76

(In Cr$ millions at constant 1971 values)

	Actual	Projected					Total	Percentage
	1971	1972	1973	1974	1975	1976	1972-76	Distribution
Public Sector Investment	3,000	5,122	5,882	6,538	7,395	8,305	33,242	56.7
Federal Investment	1,852	3,267	3,702	4,197	4,777	5,437	21,380	36.5
State and Municipal Investment		1,855	2,180	2,341	2,618	2,868	11,862	20.2
Private Investment	4,500	4,135	4,290	4,965	5,820	6,155	25,365	43.3
Total Fixed Investment in Northeast	7,500	9,257	10,172	11,503	13,215	14,460	58,607	100.0
Financing of Investments:								
Federal Government Financing								
Federal Savings 1/	1,800	3,126	3,436	3,875	4,354	4,908	19,697	33.6
Federal Transfers to States and Municipalities	1,150	1,485	1,685	1,811	2,003	2,217	9,201	15.7
Art. 34/18 Investment Funds	778	575	631	692	760	833	3,491	6.0
Federal Total	3,828	5,186	5,752	6,378	7,115	7,958	32,389	55.3
State and Municipal Financing:								
Current Account Deficit	-625	-509	-633	-785	-810	-824	-3,561	-6.1
Net Borrowing from International Development Agencies	150	227	395	347	449	515	1,933	3.3
Loans Already Contracted		270	328	143	53	21	815	1.4
Loans to be Contracted		-	127	275	476	581	1,459	2.5
Amortization		-	-60	-71	-80	-87	-341	-0.6
Other Funds	4,147	4,353	4,658	5,563	6,461	6,811	27,846	47.5
State Domestic Borrowing 2/	190	345	486	487	506	536	2,360	4.0
Supplementary Funds to 34/18 Projects 3/	1,000	1,360	1,370	1,510	1,810	1,810	7,860	13.4
BNH Loans for Housing plus Associated Private Funds	600	600	660	726	800	880	3,666	6.3
Unidentified	2,057	2,048	2,112	2,840	3,345	3,585	13,960	23.8

1/ Corresponds to federal investment minus net federal borrowing from international development agencies to finance Northeast federal investment.

2/ Including BNH funding of water supply and sewerage projects.

3/ Excluding loans from international development agencies.

five-year period, or US$70 million annually. This compares with actual commitments of roughly US$40 million annually in 1967-71. Even assuming the timely disbursements of old and new loans, net development financing would be limited to only 3 percent of total investment.

230. In addition to federal funds and external development loans, other easily identifiable sources of financing are local government borrowing from the banking system, private funds associated to 34/18 projects and BNH loans for housing plus associated private funds. However, the sources of finance so far identified do not provide the full financing of capital requirements. There is a remaining gap of about Cr$15 billion. Part of it, as in the past, will be filled through some combination of additional private sector savings originating in the Northeast and/or elsewhere in the country, other private sector borrowing from the banking system, as well as additional external financing through suppliers' credits and financial credits (all included under "unidentified" in Table above). In 1971 these sources accounted for about 27 percent of overall Northeast investment, equivalent to 46 percent of private investment in the region. 1/ For 1972-76 "unidentified" funds will be proportionately lower than in the past if compared with overall investment (24 percent) but proportionately higher if compared with private investment (55 percent). Since most of these "unidentified" funds will finance private investment, the latter is a more meaningful comparison.

231. This emphasizes one of the concerns originating from the Government's decision to preempt half of the 34/18 funds for public as opposed to private programs. In addition to the resulting decline in availability of public resources for private investment, these preempted funds would normally have led to the mobilization of at least an equal amount of private resources for 34/18 investment projects. This effect of the change in government policy may be partially offset by modification -- along the lines described above in para. 215 -- of SUDENE regulations governing the relative shares of public and private capital in 34/18 projects. Nevertheless, if Northeast capital formation is to proceed at a pace commensurate with the regional growth target, government transfers additional to those presently provided for, together with more liberal support by federal financial intermediaries such as PIS, the BNDE and the BNH may be required.

1/ The comparison with private investment is not fully orthodox, since these sources of financing include some loans to the public sector.

V. IMPLICATIONS FOR DEVELOPMENT AID

A. The Challenge for External Assistance

232. As discussed earlier, external assistance so far has played a minor role in the development of the Northeast. Quantitatively, it is likely that the contribution of official external lenders to the region's investment financing will continue to be small, because of the expected continued large transfer of federal funds and of the scarcity of projects suitable for external financing.

233. Although the presently budgeted interregional resource transfer may have to be increased if it is to be fully adequate to finance the investment requirements of the Northeast economy, it is very hard to make a case for external assistance to the region on resource gap grounds. However, in the Northeast, as in most underdeveloped areas, there is a serious shortage of technical information on resource potential and development techniques. Thus, foreign aid can play a major role for the development of the region in the field of technical assistance. There is a clear need to increase the Northeast's absorptive capacity, by improving the operating efficiency of the system and by identifying, through research, the region's comparative advantages in agriculture as well as in industry.

234. With the AID program being phased out, IDB and IBRD are expected to provide the bulk of official external resources flowing into the area. In addition, United Kingdom and German bilateral aid programs are presently being formulated. Their scale of operations, however, will be relatively small. The present lending program of the Washington agencies contemplates new commitments of about US$350 million in 1972-76 for the Northeast itself. In addition, a US$30 million loan for the Amazon colonization is envisaged.

235. The purpose of this chapter is to identify new project areas where additional loans can develop if the development agencies want to respond to the suggested increase in federal transfers. Probably the most difficult question in the development and foreign assistance field is the appropriate mix of short-term projects that produce immediate visible results and longer range programs that are more fundamental. The basic economic challenge is to enlarge employment opportunities and increase regional productivity. Improved welfare services are important investments in human beings, but if they are not accompanied by progress on the employment and the production front, they cannot create a permanent change in expectations. Among the proposed projects described below, three categories may be distinguished: welfare projects (nutrition, low-cost housing, sewerage); production projects (agricultural credit, agro-industry, feeder-roads, tourism, industry); and long term projects (agricultural research, education). An appropriate mix of the three components is essential for success in the Northeast of official external assistance.

Table 32: IDB AND IBRD LENDING PROGRAM, 1972-76

(In US$ million)

	1972	1973	1974	1975	1976	Total
IDB	-	97	65	35	-	197
Petrochemicals (Bahia)		12				
Electric Power (Moxoto)		35				
Agriculture (Proterra)		50				
Education (15% for Northeast)			5			
Electric Power (Sobradinho)			60			
Irrigation (DNOCS)				15		
Highways (DNER)				20		
IBRD	12	115	39	20	-	186
Land Settlement (Maranhao)	12					
Ports II (Recife)		10				
Water Supply and Sewerage III (Bahia)		35				
Industry (BNB)			25			
Electric Power (Paulo Afonso IV)		40				
Education				20		
Highway V (14% to Northeast)			14			
Land Settlement II (Amazon)		30				
TOTAL	12	212	104	55	-	383

236. The region can be a valuable experimental area for improving foreign assistance knowledge and tools, particularly as related to the widespread problem of regional underdevelopment.

B. Project Areas

237. Visits to SUDENE, SUDAM, BNB and North/Northeast state governments led the mission to conclude that there are few projects readily available for external financing. Project lending has to be preceded by substantial assistance in project preparation, in many cases with a long lead time. Considerable technical assistance in the organization and management of project institutions in sectors such as agriculture and education will be needed. The relatively small size of individual projects constitutes an additional problem. The mission was able, however, to identify several areas where projects may develop for future consideration by external agencies.

Agriculture

238. Up to now, the involvement of development agencies in North east agriculture has been limited to infrastructure. In part, this is related to the Government's firm policy of providing agricultural credit at subsidized interest rates without monetary correction. If agreement on indexing could be reached, the external agencies might help to finance a supervised agricultural credit scheme for small holders tied to the research/extension project described below. Development of and association with such a scheme could be useful in building institutions and programs designed for the weakest section of the rural society, which is presently unable to compete with the credit demands of larger scale operators. The financial intermediary could be the BNB's Rural Department, which needs to be strengthened.

239. Subsidization may be accepted if the use of the subsidized credit is effectively supervised and the degree of subsidization fixed in advance rather than left free to fluctuate with varying price behavior. Under such conditions the risk of misallocation of resources and uneconomic use of investment goods would be much less than under the generalized and indeterminate credit subsidization which presently exists. Moreover, in the case of small holders, the risk of diversion of subsidized agricultural credit to more remunerative investment in the urban sector is small, because of the borrower's limited investment horizon. It might initially prove difficult to get small farmers to accept indexing, as they are not accustomed to ex-post monetary correction.

240. Perhaps the most promising way to assist the long-term development of Northeast agriculture is to strengthen agricultural research in the area. External agencies probably could perform a very useful role in helping to overcome existing institutional bottlenecks. (See Chapter III, B.) A major component of any research project should be for training, as well as for establishment of new experiment stations and the relocation of some existing ones.

As in the case of the IBRD-financed agricultural research project in Spain, research centers could be set up to deal with specialized agricultural activities on an interdisciplinary basis. Land tenure and settlement policy should be one of the endogenous variables of such a research program. Linkage with agricultural extension services is essential. The two agroeconomic and social research centers can be envisaged; one in the Northeast for dry land farming and the other in the frontier region for Amazon agriculture, settlement and ecology.

241. A third kind of agricultural project would focus on creation of productivity employment for labor displaced as a result of sugar industry reorganization. Provisions for employing these workers in other activities have not been made. As discussed in Chapter III, C, an agro-industry project is presently being prepared by the Pernambuco state government. This experimental project, which has federal backing, probably deserves external support as well.

242. A recent organization of the salt industry in the state of Rio Grande do Norte has resulted in a serious unemployment problem for 4,000 families. A cashew project, now under preparation by a private consulting firm, BRASTEC, contemplates the use of 60,000 hectares of presently abandoned land for cultivation of cashew (which has excellent export prospects), together with traditional crops (rice, beans) by the displaced salt mine workers. Total cost is estimated around US$10 million.

243. The Federal Government is studying the processing and marketing of about twenty Northeast agricultural products. It expects that this study -- to be finished in 1973 -- will justify the establishment of an US$80 million investment credit line for agro-industry throughout the Northeast. This potential project also is worthy of serious attention by external lenders.

Industry

244. High prices have been one of the main factors contributing to sparse use of fertilizers in the Northeast. PETROQUISA, a PETROBRAS subsidiary, is studying a low-cost 1,000 ton per day ammonia plant based on natural gas in Bahia. The estimated cost is US$30 million and the foreign exchange component US$13 million. The exploitation of potash deposits in Sergipe also affords interesting project prospects (estimated cost US$100 million).

Tourism

245. Despite the great natural attractions for tourism in the Northeast, a Northeast tourism project in that area could be hardly justified in terms of foreign exchange earnings, as international tourism is hampered by high air fares. The purpose of external assistance to a Northeast tourism project would be to promote labor-intensive activities and inter-regional trade; the tourists would come from affluent urban centers to the south. As already discussed in Chapter IV, A, developing Northeast tourism may become a significant factor in redressing regional imbalances in employment and income. Restoration and preservation of Olinda, an artistic colonial city near Recife, which is presently

eroded by the sea, plus the improvement of the Recife-Olinda highway could become the main components of a tourism project in the Recife area.

Transport

246. The need for feeder roads has been analyzed in Chapter II, C. The USAID's US$25 million loan for a nationwide program of feeder road construction is not sufficient to cover the most urgent needs of the Northeast states. If the USAID loan is fully disbursed by the end of 1974, a new program could be formulated for the construction of 7,500 km of rural roads in all Northeast states during 1975-77. Total project cost would be around US$80 million. Following the financing formula of the USAID project, the external agencies would provide 30 percent of total project cost (US$24 million), the remainder being financed by the BNDE (30 percent) and state and municipal governments (40 percent). As already mentioned, institution building would be another important justification for development agencies' involvement in the project.

Education

247. The education sector of Northeast Brazil presents the development agencies with an opportunity to have a broad constructive impact in a number of important ways. Marked by extremely poor quality of instruction, particularly at the lower education levels, and little relevance to manpower needs and opportunities, the formal education system would benefit greatly from technical assistance in such areas as teaching methods and curriculum improvement, utilization of space, and planning and programming. Such qualitative improvements would not only increase the relevance of available facilities but also facilitate much needed expansion of educational opportunities by reducing unit costs. In the long run, the region's success in expanding educational opportunities can be expected to play a crucial role in the pattern of income distribution. Official lenders should not be deterred by the small size of Northeast education projects. External assistance in the education sector would provide a timely input to efforts already underway to reform and expand Brazil's education system nationally. Assistance at this time would help to assure that the educational disparities between the Northeast and the rest of Brazil are reduced rather than widened as a result of current nationwide reforms. Project areas in which external lenders could have a maximum direct impact, with illustrations for specific projects in Ceara and Pernambuco, are the following:

Education Project 1: Construction and equipment of centers for teaching practical courses to allow students to explore their interest and practical abilities in such areas as industrial arts, agriculture, commerce and home economics. The emphasis of the various programs and the simple equipping of facilities would be related to the environment of the school's location. Such courses would be required during the last two years of the new basic education cycle (grades 7-8). The centers would serve satellite schools offering the academic part of the curriculum of basic education. Tentative and rough projections for fifty such centers in each of two states (Ceara and Pernambuco) to provide facilities for about one-third of 7th and

8th grade enrollments suggest an estimated cost of approximately US$6 million in each state.

Education Project 2: Teacher upgrading programs, that would include in some states the construction and equipping of teacher training centers or conversion of existing facilities to such centers. Projections made for such a project in Ceara and Pernambuco alone indicate that the upgrading over a six-year period of 80 percent of the unqualified teachers now working in these states would cost some US$7.5 million.

Education Project 3: Extension of technical assistance at federal and state levels, to improve and develop capability for curriculum development and evaluation, education planning, education finance analysis and budgeting and management and administration. One of the specialists' tasks would also be to develop an economic alternative for a more efficient means of educating average students at the primary level.

Education Project 4: Construction and equipping of technical high schools (grades 9-12) and related teacher training, required to supplement the education system's capacity in meeting requirements for middle-level manpower. However, further identification of such state and regional manpower needs is necessary to determining required capacity.

Education Project 5: Expanding and strengthening vocational training as required in each state. Construction and equipping of a vocational training center to be used by the National Service of Industrial Apprenticeship (SENAI) in Pernambuco, would have a threefold function: (a) to supplement the activities of SENAI's main existing centers; (b) to serve as a regional center for teaching specific skills required for the industrial development of the Northeast, skills for which training facilities do not exist in the region or are currently inadequate; and (c) to serve as regional instructor training center for other SENAI operations in the Northeast. The project would cost an estimated US$1 million.

Education Project 6: Provision, on a pilot basis, of mobile units equipped with audio-visual aids to assist in the short teacher training courses offered to groups of local teachers in the alphabetization program (MOBRAL). The provision of 50 such mobile units would cost an estimated US$400,000.

Education Project 7: Training for extension agents and farmers. A pre-investment study would be necessary in this case to identify (a) the educational and other background and the training program needed to develop an agricultural technician capable of responding to small farmers'demands for guidance; and (b) the most efficient arrangements for farmer training.

Nutrition

248. In recent years, Brazil has been devoting considerable attention to the quality of nutrition. To this end, the Government intensified a national school lunch program within the Ministry of Education. In the Northeast, the

Institute of Nutrition (Federal University of Pernambuco) has completed several studies on levels of nutrition and is pursuing additional research on local foods trying to identify their nutritional value. In addition, with state government collaboration, the institute maintains various relief centers where gravely undernourished children receive special care. The institute's work now has the support of international organizations to enlarge both its scientific and operational role. A nutrition project in Northeast Brazil would have various objectives:

(a) promote research conducive to identifying new local sources of calories and proteins;

(b) design, in conjunction with the Institute, a special program that would emphasize attention and care for the most vulnerable age groups; and

(c) promote regional campaigns to bring about appropriate changes in dietary habits.

Costs involved must yet be estimated and might be part of a broader socio-agricultural research effort. The program would integrate nutrition into a health and educational scheme so as to have lasting effects.

Housing

249. As in the rest of the country, the National Housing Bank's (BNH) activities in the Northeast are concentrated on middle-income housing. Families with incomes below the minimum wage are virtually not reached by BNH programs in the Northeast, although the great majority of the families living in Northeast shanty-towns fall into this low-income category. Thus, the possibility of developing the following projects in the major Northeast cities (Recife, Salvador and Fortaleza) should be explored:

(a) "site and services" projects to provide urbanized land on which the occupants can build their own dwellings using self-help methods; and

(b) improvement of existing low-income settlements through the provision of minimum urban services.

Sewerage

250. SUDENE is preparing a project contemplating the construction of sewerage systems in the nine main Northeast cities, with the aim of increasing to 15 percent the proportion of the region's urban population served by sewerage facilities. Feasibility studies for some cities have been completed. The total cost of the project would be around US$80 million, with a US$20 million foreign exchange component.

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Table 1: GROSS REGIONAL PRODUCT BY SECTOR OF ORIGIN, 1959-71 1/

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
						(In Cr$ millions at constant 1971 values)							
Total	13,640	14,904	15,682	16,474	17,496	18,696	19,432	20,249	22,430	24,563	26,280	26,044	28,544
Agriculture	4,820	5,187	5,389	5,584	5,973	6,384	6,695	6,455	7,376	7,834	7,940	6,598	7,812
Industry	3,080	3,125	3,348	3,570	3,631	3,822	4,070	4,527	4,766	5,545	6,003	6,714	7,278
Services	5,740	6,592	6,945	7,320	7,892	8,490	8,667	9,267	10,288	11,184	12,337	12,732	13,454
						(Percentage contribution of each sector to total regional product in real terms)							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	35.3	34.8	34.4	33.9	34.1	34.2	34.5	31.9	32.9	31.9	30.2	25.3	27.4
Industry	22.6	21.0	21.3	21.7	20.8	20.4	20.9	22.3	21.2	22.6	22.8	25.8	25.5
Services	42.1	44.2	44.3	44.4	45.1	45.4	44.6	45.8	45.9	45.5	47.0	48.9	47.1
						(Percentage annual rate of growth of real regional product and real final output by sector)							
Real Regional Product		9.3	5.2	5.0	6.2	6.9	3.5	4.2	10.8	9.5	7.0	-0.9	9.6
Agricultural Sector		7.6	3.9	3.6	7.0	6.9	4.9	-3.6	14.3	6.2	1.3	-16.9	18.4
Industrial Sector		1.5	7.1	6.6	1.7	5.3	6.5	11.2	5.3	16.3	8.3	11.8	8.4
Service Sector		14.8	5.4	5.4	7.8	7.6	2.1	6.9	11.0	8.7	10.3	3.2	5.7

Source: SUDENE, Assessoria Tecnica

1/ At factor cost.

Table 4: GROSS REGIONAL PRODUCT PROJECTED BY SECTORS, 1969-1980
(In Cr$ millions at constant 1971 values)

	Actual	Estimated		Projected								
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Gross Regional Product of Northeast	24,280	26,044	28,544	31,500	34,795	38,450	42,490	46,950	51,880	57,330	63,350	70,000
Agriculture	7,240	6,598	7,812	8,330	8,890	9,485	10,120	10,800	11,525	12,300	13,120	14,000
Industry	6,003	6,714	7,278	8,345	9,570	10,975	12,590	14,440	16,565	19,000	21,795	25,00
Manufacturing	3,175	3,555	3,910	4,480	5,130	5,875	6,725	7,700	8,850	10,145	11,675	13,410
Construction	2,006	2,224	2,335	2,665	3,095	3,565	4,100	4,720	5,400	6,175	7,060	8,075
Mineral Extraction	517	590	660	755	865	985	1,130	1,290	1,490	1,720	1,985	2,290
Electricity and Water Supply	305	345	373	425	480	550	635	730	825	940	1,075	1,225
Services	12,337	12,732	13,454	14,825	16,335	17,990	19,780	21,710	23,790	26,030	28,435	31,000
Commerce	4,200	4,325	4,670	5,100	5,560	6,055	6,600	7,200	7,780	8,405	9,075	9,800
Transport and Communications	1,245	1,270	1,335	1,485	1,650	1,835	2,045	2,275	2,510	2,770	3,055	3,375
Finance, Insurance and real estate	3,317	3,417	3,622	3,965	4,335	4,750	5,195	5,685	6,215	6,795	7,430	8,125
Community and Personal Services	3,575	3,720	3,827	4,275	4,790	5,350	5,940	6,550	7,285	8,060	8,875	9,700

Sources: SUDENE, Assessoria Tecnica; and Bank of Northeast Brazil; IBRD mission projections based on SUDENE and BNB Target Rates of Growth

Table 3: GROSSED FIXED INVESTMENT, 1966-1976

(In Cr$ millions at constant 1971 values)

	Actual				Estimate		Projection					Average Annual Increase (In %)	
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1966-71	1971-76
Total Fixed Investment In Northeast 1/	4,908	5,053	6,403	7,065	7,000	7,500	9,257	10,172	11,503	13,215	14,460	9 0	14.0
Public Sector Fixed Investment	2,269	2,225	2,715	2,767	2,530	3,000	5,122	5,882	6,538	7,395	8,305	5.7	22 6
Federal 2/	1,360	1,430	1,500	1,530	1,405	1,852	3,267	3,702	4,197	4,777	5,437	6.4	24.0
(Direct)	(1,360)	(1,430)	(1,500)	(1,530)	(1,405)	(1,780)	(2,500)	(2,875)	(3,300)	(3,800)	(4,370)	6.4	19 6
(PIN-Irrigation)	(-)	(-)	(-)	(-)	(-)	(72)	(227)	(227)	(227)	(227)	(227)	-	..
(PROTERRA)	(-)	(-)	(-)	(-)	(-)	(-)	(540)	(600)	(670)	(750)	(840)	-	...
States 3/	700	588	874	946	900	925	1,555	1,800	1,927	2,100	2,308	5 7	20 0
Municipalities 3/	209	207	341	291	225	223	300	380	414	518	560	1.4	20 0
Private Sector Fixed Investment	2,639	2,828	3,688	4,298	4,470	4,500	4,135	4,290	4,965	5,820	6,155	11.3	6.5
SUDENE-Approved Industrial Investment 4/	275	795	1,170	1,430	1,820	1,750	2,380	2,375	2,415	2,665	2,665	44.8	8 8
(With Art. 34/18 Investment Funds)	(120)	(350)	(515)	(630)	(800)	(770)	(1,000)	(950)	(850)	(800)	(800)	45.1	0.8
(With Supplementary Funds)	(155)	(445)	(655)	(800)	(1,020)	(980)	(1,380)	(1,425)	(1,565)	(1,865)	(1,865)	44.6	13.7
SUDENE-Approved Other Investment 5/	-	85	120	177	185	190	205	-	-	-	-	...	...
(With Art. 34/18 Investment Funds)	(-)	(37)	(53)	(77)	(82)	(84)	(90)	(-)	(-)	(-)	(-)	...	...
(With Supplementary Funds)	(-)	(48)	(67)	(100)	(103)	(106)	(115)	(-)	(-)	(-)	(-)	...	...
Other Private Investment 6/	2,364	1,948	2,398	2,691	2,465	2,560	1,550	1,915	2,550	3,155	3,490	1.6	6 4

1/ Projected total fixed investment (1972-76) corresponds to an average ICOR (with one year lag) of 2.85 for the global Northeast economy as compared with an average ICOR (with one-year lag) of 3.0 during the four-year period 1966-69, prior to the drought of 1970.

2/ Projected federal fixed investment (1972-76) corresponds to direct investment by the Federal Government and federal autarkies plus PIN investment in irrigation and PROTERRA, all other projected federal transfers of investment resources to the Northeast are included either in state and municipal fixed investment (using resources from Participation Funds and sale tax transfers) or in private investment (using Art. 34/18 investment funds or credit from official lending institutions).

3/ Projected fixed investment of states and municipalities (1972-76) is based on SUDENE's Development Plan for the Northeast: 1972-74 supplemented by analyses of sector requirements in electricity (Eletrobras), water supply and sewerage (BNH), and transport and education (IBRD missions)

4/ The fixed investment in SUDENE approved projects (1966-71) is determined by assuming that disbursements of Art. 34/18 investment funds from the Bank of Northeast Brazil in a given year finance on the average 44 percent of the total project investment; this ratio of 34/18 funds to total investment in a project is projected to decline gradually to 30 percent by 1976 as SUDENE adopts new project financing criteria in light of the increasing scarcity of 34/18 funds.

5/ "SUDENE-approved other investment", which is concentrated in the agricultural sector, is replaced after 1972 by investment financed through PROTERRA.

6/ The apparent contraction of other private investment "from 1971 to 1972 is the result of classifying PIN and PROTERRA as federal investment although these programs will support private investment activity in agriculture through credit and public investment that substitutes in part for purely private activity in the past

Sources SUDENE; Bank of Northeast Brazil; and IBRD mission estimates and projections based on partial information from Ministr. of Planning and SUDENE

Table 4: BALANCE OF INTER-REGIONAL MERCHANDISE TRADE, 1960-68

	1960	1961	1962	1963	1964	1965	1966	1967	1968
	(In Cr$ millions at constant 1971 values)								
Total Northeast Exports to Rest of Brazil	1,760.6	2,012.0	1,661.8	1,824.0	1,565.0	1,497.5	1,435.1	1,483.4	1,325.5
To Southeast-South 1/	1,560.3	1,820.3	1,481.2	1,625.9	1,367.3	1,295.6	1,236.2	1,225.3	1,109.2
To North-Center-West	200.3	191.7	180.6	198.1	197.7	201.9	198.9	258.1	216.3
Total Northeast Imports from Rest of Brazil	2,665.9	2,867.4	3,155.0	1,907.6	2,624.6	2,701.6	3,134.1	4,199.9	5,169.2
From Southeast-South 1/	2,553.9	2,742.6	3,062.7	1,810.3	2,524.2	2,557.5	3,052.2	4,112.2	5,076.4
From North-Center-West	112.7	124.8	92.3	97.3	100.3	144.1	81.9	87.7	92.8
Northeast Balance of Inter-Regional Merchandise Trade	-905.3	-855.4	-1,493.2	-83.6	-1,059.5	-1,204.1	-1,699.0	-2,716.5	-3,843.7
With Southeast-South 1/	-992.9	-922.3	-1,581.5	-184.4	-1,156.9	-1,261.9	-1,816.0	-2,886.9	-3,967.2
With North-Center-West	87.6	66.9	88.3	100.8	97.4	57.8	117.0	170.4	123.5
	(As a percentage of Regional Domestic Product)								
Total Northeast Exports to Rest of Brazil	11.8	12.8	10.0	10.4	8.4	7.7	7.1	6.6	5.4
To Southeast-South	10.5	11.6	8.9	9.3	7.3	6.7	6.1	5.5	4.5
To North-Center-West	1.3	1.2	1.1	1.1	1.1	1.0	1.0	1.1	0.9
Total Northeast Imports from Rest of Brazil	17.9	18.3	19.2	10.9	14.0	13.9	15.5	18.7	21.1
From Southeast-South	17.1	17.5	18.6	10.3	13.5	13.2	15.1	18.3	20.7
From North-Center-West	0.8	0.8	0.6	0.6	0.5	0.7	0.4	0.4	0.4

1/ Southeast-South States include the following: Minas Gerais, Espirito Santo, Rio de Janeiro, Guanabara, Sao Paulo, Parana, Santa Catarina and Rio Grande do Sul.

Sources: SUDENE, Assessoria Tecnica; and IBGE Foundation - Brazilian Institute of Statistics.

Table 5: RESOURCE TRANSFERS TO THE NORTHEAST REGION DUE TO FEDERAL GOVERNMENT POLICIES, 1967-76

(In Cr$ million at constant 1971 values)

	Actual				Estimate	Projection				
	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1. Direct Fixed Investment in Northeast by Federal Authorities	1,430	1,500	1,530	1,405	1,780	2,500	2,875	3,300	3,800	4,370
2. PIN - Irrigation in Northeast	-	-	-	-	72	227	227	227	227	227
3. PROTERRA	-	-	-	-	-	540	600	670	750	840
Resources from Fiscal Incentives	-	-	-	-	-	322	354	388	426	467
Transfers from PIN	-	-	-	-	-	68	76	87	99	113
Central Bank	-	-	-	-	-	150	170	195	225	260
4. Federal Government Transfers to Northeast States and Municipalities	762	1,329	1,066	1,156	1,250	1,465	1,685	1,811	2,003	2,217
State Participation Fund	304	580	289	314	325	358	410	430	475	525
Municipal Participation Fund	229	453	243	271	283	322	370	387	427	471
Special Fund	-	-	168	158	177	250	287	301	332	368
Petroleum Products Sole Tax	172	229	284	304	325	355	387	422	460	500
Electric Energy Sole Tax	32	37	42	60	75	110	125	150	172	198
Education Salary (Federal Quota)	25	30	40	49	65	90	106	121	137	155
5. Deposit Accrual in Bank of Northeast Related to 34/18 Tax Incentives	760	796	982	1,035	778	575	631	692	760	833
6. Expansion in Northeast Region of Credit to Private Sector, Net of Private Sector Deposits, by Bank of Brazil	48	200	182	264	716	503	582	650	710	783
GRAND TOTAL	3,000	3,825	3,760	3,860	4,596	5,830	6,600	7,350	8,250	9,270

Sources: Ministry of Finance (Center for Economic - Fiscal Information); SUDENE; Bank of Northeast Brazil; Bank of Brazil; and IBRD mission estimates.

Table 6: FEDERAL GOVERNMENT TAX RECEIPTS COLLECTED IN THE NORTHEAST, 1968-1970

	1968	1969	1970	Average 1968-1970
	(In Cr$ millions at constant 1971 values)			
Total Federal Tax Receipts from Northeast Brazil	1,240	1,445	1,660	1,450
Income tax	234	357	356	316
Industrial products tax	568	608	683	620
Import duties	39	39	38	39
Petroleum products sole tax	356	390	475	407
Electric energy sole tax	24	30	48	32
Minerals sole tax	4	5	11	7
Other	15	16	49	27
Federal Government Current Expenditures in Northeast Brazil 1/	1,390	1,550	1,680	1,540
	(In percent)			
Federal Tax Receipts from Northeast Brazil as a Proportion of Total Tax Receipts from All Brazil: All Taxes	7	7	7	7
Income tax	6	7	6	6
Industrial products tax	6	6	7	6
Import duties	3	3	2	3
Petroleum products sole tax	13	12	14	13
Electric energy sole tax	9	9	9	9
Minerals sole tax	6	8	14	10
Other	10	4	9	8
Ratio of Federal Tax Receipts from Northeast Brazil to Gross Regional Product at Factor Cost	5	5	6	5
Ratio of Federal Tax Receipts from All Brazil to GDP at Factor Cost for All Brazil	12	13	14	13

1/ Estimated to be 12 percent of Federal Government current expenditure (excluding revenue sharing) based on information from the Getulio Vargas Foundation (Center for Fiscal Studies) cited in: ARENA, Commissioner for Coordination of Studies of the Northeast, Study No. 1, Brasilia, 1971, (p.78).

Sources: Ministry of Finance (Center of Economic-Fiscal Information), and Getulio Vargas Foundation (Center for Fiscal Studies).

Table 7: FEDERAL GOVERNMENT TRANSFERS TO NORTHEAST BRAZIL THROUGH STATE AND MUNICIPAL PARTICIPATION FUNDS AND THE SPECIAL FUND, 1967-74

	Actual					Projection		
	1967	1968	1969	1970	1971	1972	1973	1974
	(In millions Cr$ at current prices of each year)					(In Cr$ millions at 1972 prices)		
Northeast	246.4	593.3	485.2	617.0	784.1	1,015.0	1,070.3	1,197.0
States	140.6	333.1	200.5	260.5	324.6	395.6	417.2	465.0
Municipalities	105.8	260.2	168.0	225.2	282.6	348.0	366.8	410.0
Capitals	(15.2)	(37.0)	(22.7)	(27.7)	(35.5)	(42.0)	(44.2)	(50.0)
Other	(90.6)	(223.2)	(145.3)	(197.5)	(247.1)	(306.0)	(322.6)	(360.0)
Special Fund	-	-	116.7	131.3	176.9	271.4	286.3	322.0
All Brazil	584.1	1,459.4	1,143.4	1,482.7	1,870.8	2,326.3	2,454.0	2,740.0
States	292.9	730.0	476.8	646.5	808.0	969.3	1,022.5	1,140.0
Municipalities	291.2	729.4	476.8	646.5	808.0	969.3	1,022.5	1,140.0
Capitals	(29.2)	(72.1)	(47.7)	(63.5)	(80.8)	(96.9)	(102.3)	(114.0)
Other	(262.0)	(657.3)	(429.1)	(583.0)	(727.2)	(872.4)	(920.2)	(1,026.0)
Special Fund	-	-	189.8	189.7	254.8	387.7	409.0	460.0
	(In Cr$ millions at constant 1971 prices)							
Northeast	533.2	1,033.5	700.3	742.9	784.1	862.8	909.8	1,015.5
States	304.3	580.2	289.3	313.8	324.6	336.3	354.6	395.0
Municipalities	228.9	453.3	242.6	271.0	282.6	295.8	311.8	348.5
Capitals	(32.9)	(64.6)	(32.7)	(33.3)	(35.5)	(35.7)	(37.6)	(42.5)
Other	(196.0)	(388.7)	(209.9)	(237.7)	(247.1)	(260.1)	(274.2)	(306.0)
Special Fund	-	-	168.4	158.1	176.9	230.7	243.4	272.0
All Brazil	1,264.0	2,542.3	1,650.0	1,785.2	1,870.8	1,974.0	2,080.0	2,325.0
States	633.8	1,271.7	688.0	778.4	808.0	822.0	866.5	967.0
Municipalities	630.2	1,270.6	688.1	778.4	808.0	822.0	866.5	967.0
Capitals	(63.2)	(125.6)	(68.8)	(76.5)	(80.8)	(82.8)	(86.7)	(96.7)
Other	(567.0)	(1,145.0)	(619.3)	(701.9)	(727.2)	(740.2)	(779.8)	(870.3)
Special Fund	-	-	273.9	228.4	254.8	330.0	347.0	391.0
Proportion of Transfers Allocated to Northeast:	(In percent)							
Northeast/All Brazil	42.2	40.7	42.4	41.6	41.9	43.6	43.6	43.6
State Participation Fund	48.0	45.6	42.1	40.3	40.2	40.8	40.8	40.8
Municipal Participation Fund	36.3	35.7	35.2	34.8	35.0	35.9	35.9	35.9
Capital Cities	52.1	51.3	47.6	43.6	43.9	43.3	43.3	43.3
Other Cities	34.6	34.0	33.9	33.9	34.0	35.1	35.1	35.1
Special Fund	...	...	61.5	69.2	69.4	70.0	70.0	70.0

Sources: Ministry of Planning and Bank of Brazil.

Table 8: FEDERAL GOVERNMENT TRANSFERS THROUGH THE STATE PARTICIPATION FUND AND THE MUNICIPAL PARTICIPATION FUND, BY STATES
(In Cr$ millions at constant 1971 prices)

		All Brazil	North	Northeast	Other	Maranhao	Piaui	Ceara	Rio Grande do Norte	Paraiba	Pernambuco	Alagoas	Sergipe	Bahia
1967: 1/	Total	1,264.1	85.4	533.2	645.5	70.3	38.4	84.4	30.8	45.1	77.3	32.1	25.7	129.1
	State Participation Fund	633.9	56.6	304.3	273.0	43.2	23.1	52.4	16.1	23.2	42.7	17.8	16.0	69.8
	Municipal Participation Fund	630.2	28.8	228.9	372.5	27.1	15.3	32.0	14.7	21.9	34.6	14.3	9.7	59.5
	State Capitals	(63.2)	(7.5)	(32.9)	(22.8)	(3.1)	(3.1)	(6.8)	(2.2)	(2.3)	(5.0)	(2.5)	(2.3)	(5.0)
	Other Municipalities	(567.0)	(21.3)	(196.0)	(349.7)	(24.0)	(12.2)	(25.2)	(12.5)	(19.6)	(29.6)	(11.8)	(7.4)	(53.7)
1968: 2/	Total	2,542.3	218.1	1,033.5	1,290.7	143.0	74.3	156.8	59.6	87.4	142.5	62.1	49.3	258.5
	State Participation Fund	1,271.6	156.1	580.2	535.3	88.6	44.1	93.9	30.8	44.2	74.9	32.9	30.5	139.3
	Municipal Participation Fund	1,270.7	62.0	453.3	755.4	54.4	30.2	62.9	28.8	43.2	67.6	28.2	18.8	119.2
	State Capitals	(125.6)	(19.6)	(64.6)	(41.4)	(6.0)	(6.0)	(13.4)	(4.3)	(4.3)	(9.6)	(4.8)	(4.3)	(11.9)
	Other Municipalities	(1,145.1)	(42.4)	(388.7)	714.0)	(48.4)	(24.2)	(49.5)	(24.5)	(38.9)	(58.0)	(23.4)	(14.5)	(107.3)
1969: 3/	Total	1,376.1	116.4	531.9	727.8	80.4	41.5	65.4	30.9	46.2	73.2	32.1	27.6	134.6
	State Participation Fund	688.0	83.9	289.3	314.8	50.1	24.9	33.9	15.4	22.6	37.1	17.2	17.2	70.9
	Municipal Participation Fund	688.1	32.5	242.6	413.0	30.3	16.6	31.5	15.5	23.6	36.1	14.9	10.4	63.7
	State Capitals	(68.8)	(10.2)	(32.7)	(25.9)	(3.5)	(3.5)	(5.0)	(2.2)	(2.5)	(4.8)	(2.5)	(2.5)	(6.2)
	Other Municipalities	(619.3)	(22.3)	(209.9)	(387.1)	(26.8)	(13.1)	(26.5)	(13.3)	(21.1)	(31.3)	(12.4)	(7.9)	(57.5)
1970: 3/	Total	1,556.8	173.7	584.8	798.3	88.5	45.3	71.8	34.0	51.2	80.5	35.2	30.1	148.2
	State Participation Fund	778.4	130.8	313.8	333.8	54.6	26.9	36.8	16.7	24.5	40.1	18.7	18.7	76.8
	Municipal Participation Fund	778.4	42.9	271.0	464.5	33.9	18.4	35.0	17.3	26.7	40.4	16.5	11.4	71.4
	State Capitals	(76.5)	(16.9)	(33.3)	(26.3)	(3.5)	(3.5)	(5.0)	(2.3)	(2.8)	(4.9)	(2.5)	(2.5)	(6.3)
	Other Municipalities	(701.9)	(26.0)	(237.7)	(438.2)	(30.4)	(14.9)	(30.0)	(15.0)	(23.9)	(35.5)	(14.0)	(8.9)	(65.1)
1971: 3/	Total	1,616.0	181.8	607.2	827.0	84.8	47.8	75.8	35.6	53.4	84.7	37.4	31.7	156.0
	State Participation Fund	808.0	138.4	324.6	345.0	50.3	28.5	38.9	17.7	25.9	42.5	19.8	19.7	81.3
	Municipal Participation Fund	808.0	43.4	282.6	482.0	34.5	19.3	36.9	17.9	27.5	42.2	17.6	12.0	74.7
	State Capitals	(80.8)	(17.9)	(35.5)	(27.4)	(3.8)	(3.8)	(5.4)	(2.4)	(2.7)	(5.3)	(2.7)	(2.7)	(6.7)
	Other Municipalities	(727.2)	(25.5)	(247.1)	(454.6)	(30.7)	(15.5)	(31.5)	(15.5)	(24.8)	(36.9)	(14.9)	(9.3)	(68.0)

1/ In 1967 the Federal Government allocated to the Participation Funds the equivalent of 14 percent of the revenue collected from the federal income tax and the tax on industrial products.

2/ In 1968 the Federal Government allocated to the Participation Funds the equivalent of 20 percent of the revenue collected from the federal income tax and the tax on industrial products.

3/ In 1969, 1970 and 1971 the Federal Government allocated to the Participation Funds the equivalent of 10 percent of the revenue collected from the federal income tax and the tax on industrial products.

Sources: Ministry of Planning; and the Bank of Brazil

Table 9: TRANSFER OF FUNDS TO THE NORTHEAST THROUGH TAX INCENTIVES FOR JURIDICAL PERSONS, 1968-1976

	ACTUAL			ESTIMATE	PROJECTION					ANNUAL AVERAGE		Compound Annual Increase
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1968-70	1972-76	
	(in Cr$ millions at constant 1971 values)									(in 1971 Cr$ millions)		(in percent)
Total Income Tax Declared	2,858	3,457	3,984	4,370	4,795	5,260	5,770	6,330	6,945	3,433	5,820	11.1
Deductions for all Incentives	1,372	1,689	1,892	2,095	2,300	2,525	2,770	3,040	3,333	1,651	2,795	12.0
Deductions for Northeast	796	982	1,035	850	1,124	1,212	1,307	1,413	1,527	938	1,317	7.0
34/18 Investment Funds	(796)	(982)	(1,035)	(778)	(575)	(631)	(692)	(760)	(833)	(938)	(700)	-5.6
PROTERRA	(-)	(-)	(-)	(-)	(322)	(354)	(388)	(426)	(467)	(-)	(390)	...
PIN-Irrigation	(-)	(-)	(-)	(72)	(227)	(227)	(227)	(227)	(227)	(-)	(227)	...
	(in millions of US$)									(in millions of US$)		(in percent)
Total Income Tax Declared	541	654	754	827	907	995	1,092	1,198	1,314	650	1,100	11.1
Deductions for all Incentives	260	320	358	396	435	478	524	575	631	312	530	12.0
Deductions for Northeast	151	186	196	161	213	229	247	267	289	177	250	7.0
34/18 Investment Funds	(151)	(186)	(196)	(147)	(109)	(119)	(131)	(144)	(158)	(177)	(132)	-5.6
PROTERRA	(-)	(-)	(-)	(-)	(61)	(67)	(73)	(80)	(88)	(-)	(75)	...
PIN-Irrigation	(-)	(-)	(-)	(14)	(43)	(43)	(43)	(43)	(43)	(-)	(43)	...
	(in percent)											
Ratio of Total Deductions for All Incentives, Tax Declared	48.0	49.0	47.5	47.9	48.0	48.0	48.0	48.0	48.0	48.2	48.0	
Ratio of Deductions for Northeast: Total Deductions	58.0	58.1	54.7	40.6	48.9	48.0	47.2	46.5	45.8	56.8	48.0	
Annual Real Increase of Total Tax Declared	...	21.0	15.2	9.7	9.7	9.7	9.7	9.7	9.7	...	9.7	
Annual Real Increase of Total Deductions	...	23.1	12.0	10.7	9.8	9.8	9.7	9.7	9.6	24.4	9.8	
Annual Real Increase of Deductions for Northeast	...	23.4	5.4	-17.9	32.2	7.8	7.8	8.1	8.1	10.8	7.9	

Source. Ministry of Finance, Center for Economic-Fiscal Information (CIEF), Ministry of Planning and General Coordination; and Mission estimates.

Table 10: ARTICLE 34/18 TAX CREDIT FUNDS FOR THE NORTHEAST, 1962-71
(In Cr$ millions at current prices of each year)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Total Income Tax Paid by Firms	58.0	122.0	195.0	404.6	481.3	632.9	896.0	1,433.6	1,848.9	2,730.5 3/
Total Income Tax Deducting Declared by Firms	5.7	8.8	40.6	162.4	273.4	506.5	787.7	1,170.6	1,571.0	1,578.3 4/
SUDENE (Art. 34/18 Tax Credits)	5.7	7.7	37.3	149.4	226.6	351.1	465.9	626.6	798.8	748.0
SUDAM (Amazon region)	-	1.1	3.3	13.0	46.8	102.9	164.9	280.2	351.6	327.3
SUDEPE (fishing industry)	-	-	-	-	-	-	44.2	138.7	215.2	158.8
Tourism	-	-	-	-	-	-	36.0	44.6	68.5	65.4
Reforestation	-	-	-	-	-	-	11.6	41.3	103.1	287.8
Aviation	-	-	-	-	-	-	-	-	1.6	———
State of Espirito Santo	-	-	-	-	-	-	-	-	5.3	———
Stock Market	-	-	-	-	-	52.5	65.1	59.2	24.4	———
Other	-	-	-	-	-	-	-	-	2.5	———
Deposits of Tax Credit Resources in Bank of Northeast Brazil (BNB)										
Accruals 1/	5.7	7.7	37.3	149.4	226.6	351.1	456.7	680.8	859.3	777.6
Disbursements	-	-0.3	-5.2	-8.7	-43.3	-178.7	-326.2	-490.0	-732.4	-854.2
Net Flow During Year	5.7	7.4	32.1	140.7	183.3	172.4	130.5	190.8	126.9	-76.6
(Year-End Deposit Balance)	(5.7)	(13.1)	(45.2)	(185.9)	(369.2)	(541.6)	(672.1)	(862.9)	(989.8)	(913.2)
				(In percent)						
Ratio of Income Tax Deductions by Firms To Income Tax Paid by Firms	10	7	21	40	57	80	88	82	85	58
Ratio of Art.34/18 Deductions for NE To Total Income Tax Deductions	100	88	92	92	83	69	59	54	51	47
Ratio of Year-End 34/18 Deposits in BNB To Total Liabilities 2/ and Capital of BNB	...	...	45	63	65	65	54	53	48	41

Sources: Ministry of Finance (Center for Economic - Fiscal Information) and Bank of Northeast Brazil

1/ Accruals include not only Art.34/18 tax credits but also deductions for tourism and reforestation to be applied in the Northeast.
2/ Includes a small amount of contingent liabilities in the form of bank guarantees.
3/ Includes Federal Government's receipts from juridical persons in 1971 of Cr$560.9 million for PIN.
4/ After pre-emption by Federal Government of a portion of tax credits for PIN.

Table 11: POTENTIAL EFFECT ON ICM REVENUES OF NORTHEAST STATES FROM EQUAL SHARING OF ICM LEVY ON INTERSTATE TRADE

	Interstate Exports	Interstate Imports	Net Intrastate Trade	Net Yield of ICM @ 7% on 3/4 Trade	Total ICM Revenue 1968	Ratio of Increase to Actual
	(In Cr$ millions at constant 1971 values)					(In percent)
Maranhao	201.3	427.0	-225.7	11.8	63.1	19
Piaui	98.8	264.1	-165.3	8.7	34.0	26
Ceara	328.4	1,079.9	-751.5	39.5	180.5	22
Rio Grande do Norte	179.6	408.0	-228.4	12.0	63.0	19
Paraiba	285.4	583.5	-298.1	15.0	99.8	15
Pernambuco	1,518.7	2,140.0	-621.3	32.6	424.6	8
Alagoas	243.5	464.7	-221.2	11.6	83.5	14
Sergipe	165.0	465.4	-300.4	15.8	41.9	38
Bahia	776.2	1,808.0	-1,031.8	54.2	375.6	14
Northeast Sum	3,796.9	7,640.6	-3,843.7	201.8	1,365.6	15

Source: Ministry of Finance (Subsecretariat of Economy and Finance); and Ministry of Planning (IBGE Foundation - Brazilian Institute of Statistics).

Table 12: STATE OF SAO PAULO - TRANSFER OF TAX RESOURCES TO REST OF BRAZIL THROUGH PARTICIPATION FUNDS AND SPECIAL FUND, 1962-70

(In Cr$ million at constant 1971 values)

	1968	1969	1970
Federal Tax Collections in Sao Paulo State:			
Income Tax	1,675	2,510	2,763
IPI	5,083	5,667	5,756
Sum	6,758	8,177	8,519
Percentage Allocated to Funds	20%	12%.	12%
Contribution of Sao Paulo State to Participation and Special Funds	1,352	981	1,022
(Of Which, Share to Northeast)	(550)	(379)	(384)
(Of Which, Share Returned to Sao Paulo)	(130)	(76)	(86)

Source: Ministry of Finance (CIEF); and Ministry of Planning.

Table 13: FEDERAL REVENUE COLLECTED IN SAO PAULO STATE, 1968-1970

	1968	1969	1970
	(In Cr$ millions at current prices)		
Total Federal Government Revenues	9,951.6	14,400.9	18,528.5
Import duties	815.7	1,078.0	1,329.8
Income taxes	2,173.1	3,763.7	4,897.1
Industrialized products tax	5,075.4	6,751.4	8,505.5
Petroleum products sole tax	1,597.3	2,288.8	2,852.5
Electric energy sole tax	157.2	233.3	449.6
Minerals sole tax	37.3	44.4	68.0
Road transport (passenger) tax	1.0	0.7	81.0
Other taxes and fees	94.6	240.6	345.0
Federal Government Revenue from Sao Paulo	5,047.6	7,216.5	9,026.0
Import duties	518.5	750.1	885.5
Income taxes	961.3	1,739.5	2,294.5
Industrialized products tax	2,918.1	3,926.9	4,780.7
Petroleum products sole tax	562.4	667.7	739.1
Electric Energy sole tax	65.2	106.1	202.9
Minerals sole tax	5.3	5.2	9.8
Road transport (passenger) tax	-	-	18.2
Other taxes and fees	16.8	21.0	95.3
		(In percent)	
Proportion of Federal Revenues from Sao Paulo			
Total Federal Government revenues	50.7	50.1	48.7
Import duties	63.6	69.6	66.6
Income taxes	44.3	46.2	46.9
Industrialized products tax	57.5	58.5	56.2
Petroleum products sole tax	35.2	29.2	25.9
Electric energy sole tax	41.5	45.5	45.1
Minerals sole tax	14.2	11.7	14.5
Road transport (passenger) tax	-	-	22.5
Other taxes and fees	17.8	8.7	27.6

Source: Ministry of Finance, Center for Economic-Fiscal Information (CIEF).

Table 14: FEDERAL INCOME TAX DEDUCTIONS UNDER INVESTMENT INCENTIVE SCHEMES CLAIMED BY FIRMS IN SAO PAULO STATE, 1968-1970

	1968	1969	1970
	(In Cr$ million at current prices)		
All Brazil			
Actual tax liability	853	1,225	1,738
Assessed tax liability	1,641	2,396	3,309
Less: Investment tax credits	-788	-1,171	-1,571
Northeast	(466)	(627)	(799)
Amazon	(165)	(260)	(332)
Fishing Industry	(44)	(139)	(215)
Tourism	(36)	(45)	(69)
Reforestation	(12)	(41)	(103)
Brazilian Aircraft Company	(-)	(-)	(2)
State of Espirito Santo	(-)	(-)	(5)
Share investment	(65)	(59)	(24)
Other	(-)	(-)	(2)
Sao Paulo			
Actual Tax Liability	401	640	887
Assessed tax liability	785	1,230	1,691
Less: Investment tax credits	-384	-590	-804
Northeast	(211)	(288)	(379)
Amazon	(94)	(143)	(219)
Fishing Industry	(17)	(79)	(114)
Tourism	(22)	(21)	(22)
Reforestation	(8)	(22)	(54)
Brazilian Aircraft Company	(-)	(-)	(1)
State of Espirito Santo	(-)	(-)	(-)
Share Investment	(32)	(32)	(13)
Other	(-)	(-)	(-)
		(In percent)	
Ratio: Sao Paulo/All Brazil			
Actual tax liability	47	52	51
Assessed tax liability	48	51	51
Less: Investment tax credits	49	50	51
Northeast	45	46	47
Amazon	57	57	57
Fishing Industry	39	57	53
Tourism	61	47	46
Reforestation	67	54	52
Brazilian Aircraft Company	-	-	50
State of Espirito Santo	-	-	-
Share investment	49	54	54
Other	-	-	50

Source: Ministry of Finance, Center for Economic-Fiscal Information (CIEF).

Table 15 STATE BUDGET RECEIPTS FROM ORDINARY REVENUES, TRANSFERS AND OTHER SOURCES, BY REGIONAL GROUPING, 1968-70

	(In Cr$ millions at constant 1971 values)				(Regional share as a percentage of total)			
	Brazil Total	Southeast & South 1/	Northeast	North & Center & West	Brazil Total	Southeast & South 1/	Northeast	North & Center & West
1968:								
Total State Budget Receipts	16,945.5	13,657.7	2,066.3	1,221.5	100.0	80.6	12.2	7.2
Ordinary Revenues	12,978.8	11,423.7	1,142.5	412.6	100.0	88.0	8.8	3.2
ICM Revenue	11,988.8	10,522.4	1,092.5	373.9	100.0	87.8	9.1	3.1
Other Taxes and Fees	990.0	901.3	50.0	38.7	100.0	91.0	5.1	3.9
Transfers Received	2,092.3	822.0	627.3	643.0	100.0	39.3	30.0	30.7
State Participation Fund	1,271.6	436.0	580.2	235.4	100.0	35.9	45.6	18.5
Special Fund	-	-	-	-	-	-	-	-
Other Transfers	820.7	366.0	47.1	407.6	100.0	44.6	5.7	49.7
Other Receipts (including credit)	1,874.4	1,412.0	296.5	165.9	100.0	75.3	15.8	8.9
1969:								
Total State Budget Receipts	19,737.4	15,975.8	2,276.6	1,485.0	100.0	81.0	11.5	7.5
Ordinary Revenues	14,254.4	12,477.4	1,295.2	481.8	100.0	87.5	9.1	3.4
ICM Revenue	13,113.1	11,423.0	1,255.0	435.1	100.0	87.1	9.6	3.3
Other Taxes and Fees	1,141.3	1,054.4	40.2	46.7	100.0	92.4	3.5	4.1
Transfers Received	2,481.8	1,147.0	615.9	718.9	100.0	46.2	24.8	29.0
State Participation Fund	688.0	259.7	289.3	139.0	100.0	37.8	42.0	20.2
Special Fund	273.9	33.6	168.4	71.9	100.0	12.3	61.5	26.2
Other Transfers	1,519.9	853.7	158.2	508.0	100.0	56.2	10.4	33.4
Other Receipts (including credit)	3,001.2	2,351.4	365.5	284.3	100.0	78.3	12.2	9.5
1970:								
Total State Budget Receipts	20,477.4	16,601.8	2,394.1	1,481.5	100.0	81.1	11.7	7.2
Ordinary Revenues	14,921.0	13,130.0	1,232.0	559.0	100.0	88.0	8.3	3.7
ICM Revenue	13,690.1	12,056.5	1,165.9	467.7	100.0	88.1	8.5	3.4
Other Taxes and Fees	1,230.9	1,073.5	66.1	91.3	100.0	87.2	5.4	7.4
Transfers Received	2,241.8	981.3	611.7	648.8	100.0	43.8	27.3	28.9
State Participation Fund	778.4	277.4	313.8	187.2	100.0	35.6	40.3	24.1
Special Fund	228.4	18.4	158.1	51.9	100.0	8.1	69.2	22.7
Other Transfers	1,235.0	685.5	139.8	409.7	100.0	55.5	11.3	33.2
Other Receipts (including credit)	3,314.6	2,490.5	550.4	273.7	100.0	75.1	16.6	8.3

Sources: Ministry of Finance (Subsecretariat of Economy and Finance); Ministry of Planning (IPEA/IPLAN); and Bank of Brazil.

1/ Southeast and South Regions include the following states: Minas Gerais, Espírito Santo, Rio de Janeiro, Guanabara, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul.

Table 16: DIRECT INVESTMENT BY THE FEDERAL GOVERNMENT AND FEDERAL AUTARKIES IN THE NORTHEAST, 1966-76

(In millions Cr$ at constant 1971 values)

	Actual				Estimate		Projection				
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Total Direct Federal Investment	1,360	1,430	1,500	1,530	1,405	1,780	2,500	2,875	3,300	3,800	4,370
Agriculture	76	73	49	63	...	...	242	278	320	370	425
Mining and Manufacturing Industries	490	517	471	502	...	...	765	880	1,010	1,162	1,336
Electricity	251	268	341	282	...	...	530	610	700	805	926
Basic Sanitation	115	85	78	74	...	...	50	57	65	75	86
Transportation	308	416	394	501	...	...	305	351	402	463	533
Roads	(244)	(351)	(300)	(432)	(...)	(...)	(261)	(300)	(344)	(396)	(456)
Railroads and Ports	(25)	(59)	(82)	(66)	(...)	(...)	(44)	(51)	(58)	(67)	(77)
Other Transportation	(39)	(6)	(12)	(3)	(...)	(...)	(-)	(-)	(-)	(-)	(-)
Communications and Storage	4	2	51	6	...	...	73	84	96	110	127
Education	50	34	53	44	...	...	422	485	557	641	737
Health	9	4	8	4	...	...	87	100	115	132	152
Colonization and Community Development	-	-	-	-	...	...	15	18	21	24	28
General	43	31	55	54	...	...	11	12	14	18	20

Sources: SUDENE and Ministry of Planning.

Table 17: AREA OF NATURAL ZONES, BY STATES

State	Litoral and Mata	Agreste	Semi-Arid	Fertile Spots 1/	Mid-North	Cerrado	Total
				Thousand km²			
Maranhao	-	-	-	-	320.7	-	320.7
Piaui	-	43.4	143.6	2.1	52.9	9.8	251.7
Ceara	1.6	0.2	136.0	8.0	-	-	147.9
Rio Grande do Norte	.9	3.4	47.2	1.5	-	-	53.1
Paraiba	5.4	0.6	43.6	7.0	-	-	56.6
Pernambuco	15.5	12.4	65.1	5.1	-	-	98.1
Alagoas	12.8	2.7	31.5	0.7	-	-	47.7
Sergipe	7.3	-	14.3	0.4	-	-	22.0
Bahia	83.2	106.9	277.5	9.8	-	84.7	562.1
Minas Gerais 2/	-	-	98.6	-	-	-	98.6
Region	126.8	169.7	839.4	34.6	381.5	94.4	1,646.4
Percent	7.7	10.3	51.0	2.1	23.2	5.7	100.0

Source: Ministry of Agriculture "A Agricultura da Regiao Nordeste" [1957] p. 53

1/ "Manchas Ferteis"; areas largely surrounded by semi-arid zones, but relatively well watered because of topography, exposure to prevailing winds, etc.

2/ Includes only that part of the State included in the Drought Polygon.

Table 18: SELECTED CHARACTERISTICS OF THE NORTH/NORTHEAST AND NATIONAL TOTALS, BRAZIL 1970

Item		North	Northeast	Brazil	N.	NE.	Br.
					percent		
Land area	Thos.km.	3,544	1,542	8,457	42	18	100
Primary sector output[1/]	Mil Cr$	383	4,227	18,472	2	23	100
Primary sector employment[2/]	Thous.	580	5,158	13,071	4	39	100
Crop area	Thous.ha.	360	10,181				
Cattle[3/]	Thos.head						
Tractors on farms	no.	na	6,033	na	-	-	-

1/ 1966-70 average. Gross before adjustment for intermediate consumption.
2/ Demographic Census.
3/ From annual series. 1970 preliminary census data, presently available only for the Northeast, show 14,889,000 head. Similar spreads between census and annual data occurred in all parts of Brazil in the last three censuses.

Table 19: CROP AREA, NORTHEAST 1950-1970

	Million ha.
1950	4.45
1951	4.37
1952	4.83
1953	5.07
1954	5.51
1955	5.69
1956	5.83
1957	6.31
1958	5.79
1959	6.66
1960	7.25
1961	7.68
1962	8.16
1963	8.79
1964	9.12
1965	9.49
1966	9.77
1967	10.60
1968	10.96
1969	10.91
1970	10.18

Source: IPEA (1950-1968); Min. Agr. (1969); Anuario Estatistico (1970)

Table 20: PRINCIPAL COMPONENTS OF PRIMARY SECTOR OUTPUT, NORTH/NORTHEAST, 1969

Product	Value of Output North Cr$ Million	%	Nor... Cr$ Million	
Crops				
Bananas	5.3	1	228.1	
Beans	6.5	1	419.7	
Castor Beans	-	-	72.1	
Cocoa	1.7	1/	425.0	8
Coconuts	2.1	1/	103.3	2
Corn	11.8	3	255.1	5
Cotton	0.1	1/	435.0	8
Jute	25.0	5	0.4	-
Mandioca	43.0	9	458.0	9
Oranges	5.0	1	63.6	1
Rice	23.0	5	186.3	4
Sisal	-	-	78.0	2
Sugar Cane	2.6	1	503.1	10
Tobacco	3.9	1	66.1	1
Total Specified Crops	130.0	28	3,290.7	64
Livestock				
Beef	53.1	12	392.4	8
Pork	10.5	2	109.2	2
Milk	16.3	4	267.6	5
Eggs	22.9	5	147.5	3
Total Specified Livestock	102.8	22	916.7	18
Extractives				
Babacu	0.1	1/	77.3	1
Brazil Nuts	21.0	5	-	-
Rubber	62.8	14	[illegible]	1/
Other	11.8	3	62.9	1
Total Extractives	95.7	21	140.2	3
Charcoal and Charcoal	14.8	3	127.0	2
Fisheries	39.2	9	137.7	3
Other (unspecified crops, livestock and timber)	76.7	17	536.5	10
TOTAL	459.2	100	5,141.8	100

1/ less than 0.5.

Table 21: EVOLUTION OF AGRICULTURAL OUTPUT AND SELECTED INPUTS
NORTHEAST BRAZIL, 1950-1970

		1950	1960	1970	Annual Rate 1950-60	1: .
Primary sector output, 1970 prices	Cr$ Bil.	2.82	4.15	5.84[1]	3.9	. .
Crop area	ha.mil.	4.45	7.25	10.18	5.0	3.
Cattle numbers	mil, head	9.63	11.04	14.89[2]	1.1	.
Persons employed[3]	Mil.	4.16	4.98	5.16	1.8	0.
" " [2]	Mil.	5.11[4]	6.66	7.84[2]	2.7	1.
Tractors on farms	Units	451	3,130	c,033 [2]	21.4	6.
Fertilizer	Thous. T.	--	24	59	--	.
Value of output per worker[1]	Cr$	675	835	1,130	2.1	3.
Value of Output, per ha. in crops	Cr$	635	570	570	-1.1	-
Crop area per worker	ha.	1.07	1.46	1.97	3.2	3.
Cattle, per worker	No.	2.31	2.22	2.30	-0.4	2.

1/ Note that 1970 real product was reduced 7 percent or more by drought.
2/ Agricultural Census. Data relate to July 1971.
3/ Demographic Census.
4/ Adjusted for apparent underemuneration .

Table 22: PRICES RECEIVED BY FARMERS, SELECTED PRODUCTS, BY STATES
DECEMBER, 1971

State	Cotton (Perennial)	Corn	Beans	Rice (Rough)	Beef[1/2/]	Milk
			Cr$/kg.			Cr$/liter
Maranhao	-	-	-	-	6.00	.83
Piaui	.78	.26	.94	.59	6.50	-
Ceará	1.05	.22	.53	.67	7.00	.87
Río Grande do Norte	1.33	.29	.48	.65	7.50	.67
Paraíba	1.04	.23	.50	.77	8.00	.90
Pernambuco	-	.23	.55	.64	-	-
Alagoas	-	.22	.56	.58	5.50	.60
Sergipe	-	.20	.53	.63	6.00	.50
Bahía	-	.31	.45	-	6.00[3/]	.33[4/]
Minas Gerais (Draught Polygon)	-	.40	1.03	.78	7.00[4/]	.51[4/]
Northeast	1.04	.26	.61	.66	-	-
Sao Paulo[5/]	-	.36	1.13	.83[6/]	-	-

1/ Retail price, first quality cuts.
2/ In municipio of the State capital, except as noted.
3/ Feira de Santana
4/ Montes Claros
5/ Wholesale prices, City of Sao Paulo, March 22, 1972
6/ Equivalent, converted from price of milled rice assuming 60 percent outturn.

Source: Mercados Agricolas - Informaçoes. Banco do Nordeste do Brasil S/A.
Año 4 No. 5, Janeiro 1972.

Table 23: PRICES PAID BY FARMERS, SELECTED ITEMS, BY STATES
DECEMBER, 1971

State	Hybrid seed corn Cr$/kg.	Mixed poultry feed Cr$/kg.	Ground limestone Cr$/ton	Sulphate of Ammonia Cr$/kg.	Barbed wire Cr$/400m	Plow, 1 share Cr$/each
Maranhao	.32	.70	-	.45	47.88	82.7[illegible]
Ceará	.60	.50	-	.80	43.74	76.1[illegible]
Río Grande do Norte	.49	-	-	.30	44.92	-
Paraíba	.58	-	-	.35	48.09	180.00
Pernambuco	.56	.64	-	.40	50.46	206.25
Alagoas	.68	.57	-	.25	55.56	267.7[illegible]
Sergipe	.63	.63	60.00	.27	50.44	162.50
Bahía	.50	.76	57.45	.47	57.55	340.0[illegible]
Paraná	1.09	.55	46.76	.32	43.11	119.22

Source: Getulio Vargas Foundation

Table 24: IRRIGATION PROJECTS UNDER DEVELOPMENT IN NORTHEAST BRAZIL; SIZE AND STATUS.

Stage of development in 1972 Project Name and Location	Agriculturally usable area	
	Total	Possible operation by end of 1974
	Hectares	
Reconnaissance		
Gurgueia (Piaui)	10,000	None
Reconnaissance and prefeasibility		
Saco II (Pernambuco)	1,200	500
Prefeasibility		
Corrente-Correntina (Bahia)	10,000	None
Lagoao do Piani (Piani)	5,000	400
Prefeasibility and feasitility study		
Araras (Ceara)	3,800	None
Corrente-Formoso (Bahia)	7,000	None
Lower Sao Francisco		
Marituba (Bahia)	10,000	None
Morro dos Cavalos (Vale do Fidalgo) (Piani)	10,000	None
Rio Grande (Paimeirinho, Barreiras, S. Desiderio) (Bahia)	14,400	1,800
Feasibility Study		
Capinaribe (Pernambuco)	3,000.	None
Lower Acu (Rio Grande do Norte)	8,000	None
Lower Sao Francisco - Itiuba-Propria (Alagoas-Sergipe)	3,400	None
Salitre (Bahia) 1/	11,170	None
Feasibility Study and Design		
Jequitai-Pirapora (Minas Gerais)	7,000	None
Lower Jaguaribe (Ceara)	8,400	300
System BA (Bahia) 1/	5,800	None
Design		
Gorutuba (Minas Gerais)	4,000	None
Petrolina PA-I (Massangano) (Pernambuco) 1/	6,024	None
Rio das Contas (Brumado) (Bahia)	6,700	200
System PA-II (Pernambuco) 1/	7,000	None
Design and execution		
Banabuiu-Morada Nova (Ceara)	8,187	4,800
Curu (Ceara)	7,000	3,986
Itapicuru (Bahia)	9,000	2,000
Pau dos Ferros (Rio Grande do Norte)	1,200	1,200
Planicie de Ico (including Lima Campos) (Ceara)	3,454	3,000
System BB (Bahia)	6,400	1,600
System BC (Bahia)	2,250	1,000
Execution		
Aires de Souza (Ceara)	2,120	2,120
Bebedouro - PBI (Pernambuco)	1,100	1,100
Ceara-Mirim (Rio Grande do Norte)	3,320	3,320
Moxoto-Poco da Cruz (Pernambuco)	3,000	2,000
Sao Goncalo (Paraiba)	1,100	1,100
Vaza Barris (Bahia)	2,300	2,300
23 small projects (less than 1,000 has. each)	7,600	7,600
Total	199,925	40,326

1/ Being considered by ADELA-TWIG-BRAZIL. (Four projects)
Source: Ministry of Interior

Table 35: LAND IN CROPS AS A PERCENTAGE OF TOTAL AREA: NORTHEAST AND FRONTIER STATES - 1967

Northeast 1/		Frontier States	
Ceara	19.8	Rondonia	0.2
Rio Grande do Norte	17.7	Acre	0.3
Paraiba	21.5	Amazonas	0.1
Pernambuco	16.5	Roraima	0.3
Alagoas	27.4	Para	0.9
Sergipe	15.8	Amapa	0.5
Bahia	6.0	Mato Grosso	0.9
		Goias	2.1
		Maranhao	1.2
		Piaui	1.9

1/ Excluding Maranhao and Piaui.

Source: Instituto Nacional de Colonizacao e Reforma Agraria, Instituto Brasileiro de Estatistica (IBGE).

Table 26: BRAZIL - ESTABLISHMENTS AND EMPLOYMENT IN NORTHEAST AGRICULTURE, 1950, 1960 and 1970

States	Establishments					Persons Employed in Agriculture				
	1950	1960	Δ % 50/60	1970	Δ % 60/70	1950	1960	Δ % 50/60	1970	Δ % 60/70
Maranhão	95,165	261,865	175	396,962	52	360,707	951,618	164	1,205,064	27
Piauí	34,106	87,303	156	218,011	150	206,307	358,333	74	520,505	45
Ceará	86,690	122,576	41	246,179	101	498,803	801,492	61	1,085,186	35
Rio Grande do Norte	34,391	49,840	45	104,397	109	234,737	299,419	28	312,928	5
Paraíba	69,117	117,836	70	170,174	44	434,143	553,330	27	614,034	11
Pernambuco	172,268	259,723	51	331,955	28	879,844	1,263,146	44	1,154,742	-9
Alagoas	51,961	62,484	20	105,408	69	274,985	362,979	32	460.439	27
Sergipe	42.769	65.014	52	95,931	48	154,721	249.146	61	274,371	10
Bahia	258,043	381,473	48	544,033	43	1,282,771	1,819,712	42	2,208,955	21
Total	844,510	1,408,114	67%	2,213,050	57%	3,892,875	6,659,175	71%	7,836,224	18%

Source: IBGE, Dados Preliminares Gerais do Censo Agropecuário, 1970, Região Nordeste.

Table 27: LAND USE

States	Land Use (Percentage), 1960 1/					Use of Land in Relation to the Total Area of Rural Properties, 1965 2/				
	Crops	Pastures	Forests	Fallow	Unproductive	Potentially Useful Land	Utilized	Crops	Cattle	Forests
Maranhão	10.9	30.1	26.4	24.3	8.3	86.9	47.4	8.6	20.5	15.4
Piauí	5.1	28.7	26.9	24.6	14.7	82.5	47.0	8.6	22.8	15.6
Ceará	14.3	30.8	30.1	20.2	4.5	91.5	68.7	20.0	36.0	12.7
R. G. do Norte	16.9	49.9	11.9	14.8	6.5	90.3	76.2	20.3	46.7	9.1
Paraíba	24.9	46.1	11.7	10.8	6.5	92.3	72.5	26.9	45.0	7.6
Pernambuco	23.7	32.8	20.2	19.3	4.0	90.7	69.3	25.3	30.8	13.3
Alagoas	22.9	28.3	26.4	19.1	3.3	92.3	73.4	30.9	29.4	13.1
Sergipe	12.3	50.0	17.0	16.8	4.0	93.3	70.6	18.8	42.4	9.4
Bahia	12.4	35.5	26.1	19.2	6.9	89.2	52.1	12.9	31.9	7.3
Northeast	13.9	34.4	24.4	19.9	7.3	88.6	57.4	15.3	30.5	11.5

1/ Source: Agricultural Census, 1960
2/ Source: Agricultural Census, 1960 and IBRA 1967

Table 28: FARM SIZE DISTRIBUTION IN COMPARISON TO ALL OF BRAZIL

Hectares (1 ha = 2.5 Acres)	1950				1960				1967 1/			
	% of Farm Number		% of Farm Area		% of Farm Number		% of Farm Area		% of Farm Number		% of Farm Area	
	Brazil	NE	Brazil	NE	Brazil	NE	Brazil	NE	Brazil	NE	Brazil	NE
Under 10	34.4	53.2	1.3	2.8	44.7	61.7	2.4	4.3	36.0	44.8	1.8	2.6
10 - 100	50.9	35.5	15.3	17.2	44.6	29.0	19.0	21.7	51.2	42.6	18.3	20.9
100 - 1000	12.9	10.3	32.5	40.5	9.4	7.5	34.4	43.3	11.2	11.7	34.0	43.8
1000 and Over	1.5	1.0	50.8	39.5	1.0	0.5	44.1	30.7	1.2	0.9	46.0	32.5

1/ IBRA 1967 Cadastre of Rural Properties have followed different criteria and therefore are not wholly comparable with previous agricultural census data.

Sources: NE 1950 and 1960: SUDENE IV Master Plan, p. 50. All other: IBGE, Anuario Estatistico do Brasil, 1968.

Table 29: SUDENE-APPROVED INDUSTRIAL PROJECTS, 1963-71

(In 1971 Cr$ million unless otherwise indicated)

Years	Number of Projects Approved	Total Projected Investment	Firms' Own Resources	34/18 Funds	Loan Financing	Employment Creation	Capital Cost per Job (Thousand Cr$)
1963	59	418.3	153.5	84.0	180.8	7,098	58.9
1964	52	803.6	407.1	158.8	237.7	9,478	84.8
1965	58	532.1	261.2	126.6	144.3	8,871	60.0
1966	77	931.7	222.0	423.4	286.3	21,892	42.6
1967	152	2,380.5	520.6	1,066.7	793.2	25,029	95.1
1968	145	1,661.7	398.3	889.9	373.5	22,469	74.0
1969	121	1,646.5	428.9	838.8	378.8	15,518	10.6
1970	76	1,997.7	662.6	904.1	431.0	15,926	12.6
1971	63	2,027.1	784.9	910.3	331.9	12,947	156.6
TOTAL 1963-71	803	12,399.2	3,839.1	5,402.6	3,157.5	139.228	89.1
Percentage		(100.0)	(31.0)	(43.6)	(25.4)		

Source: SUDENE.

Table 20 : VALUE OF OUTPUT IN MANUFACTURING INDUSTRIES, 1958, 1966-69

(In thousand 1971 Cr$)

	1958	1966	1967	1968	1969
Traditional Consumer Goods	3,068,007	3,887,200	3,963,976	4,343,144	4,541,232
Textiles	1,043,704	1,281,477	1,247,068	1,369,374	1,281,170
Clothing and Footwear	71,666	111,434	127,382	155,317	195,590
Food	1,617,791	1,977,589	2,044,080	2,242,653	2,439,514
Beverages	107,678	197,102	199,471	191,231	225,059
Tobacco	126,438	164,947	178,941	201,227	211,085
Printing and Publishing	59,621	93,652	105,843	114,402	113,843
Furniture and Fixtures	40,909	60,999	61,191	68,940	74,971
Intermediate Goods	1,086,810	2,475,834	1,970,733	2,493,049	2,936,219
Non-metallic Mineral	204,392	3,323,645	361,819	449,556	500,760
Metal Industries	78,409	240,758	228,672	298,030	340,705
Wood and Products	46,060	54,390	52,838	68,058	84,348
Paper and Products	48,030	50,260	77,538	77,223	71,213
Rubber and Products	8,333	20,949	24,323	22,604	26,470
Leather and Products	74,924	57,335	53,553	58,833	51,608
Chemicals	626,662	1,728,497	1,171,990	1,518,745	1,861,115
Capital Goods	16,439	124,846	178,610	263,744	330,427
Mechanical	5,757	30,975	32,964	33,027	52,590
Electrical	1,694	63,349	83,931	115,665	167,469
Transport Equipment	8,788	30,522	61,715	115,052	110,368
Other	11,894	17,863	17,078	15,633	11,911
Total	4,183,150	6,505,743	6,130,397	7,115,770	7,819,789

Source: IBGE - Producao Industrial.

Table 31 : DISTRIBUTION OF VALUE OF OUTPUT BY INDUSTRY BRANCH, 1965, 1966-69

(Percentages)

	1965	1966	1967	1968	1969
Traditional Consumer Goods	73.3	59.7	64.7	61.1	58.1
Textiles	24.9	19.7	20.3	19.3	16.4
Clothing and Footwear	1.7	1.7	2.1	2.2	2.5
Food	38.7	30.4	33.4	31.5	31.2
Beverages	2.6	3.0	3.3	2.7	2.9
Tobacco	3.0	2.5	2.9	2.8	2.7
Printing and Publishing	1.4	1.5	1.7	1.6	1.5
Furniture and Fixtures	1.0	0.9	1.0	1.0	0.9
Intermediate Goods	26.0	38.1	32.1	35.0	37.5
Non-metallic Mineral	4.9	5.0	5.9	6.3	6.4
Metal Industries	1.9	3.7	3.7	4.2	4.3
Wood and Products	1.1	0.8	0.8	1.0	1.1
Paper and Products	1.1	0.8	1.3	1.1	0.9
Rubber and Products	0.2	0.3	0.4	0.3	0.3
Leather and Products	1.8	0.9	0.9	0.8	0.7
Chemicals	15.0	26.6	19.1	21.3	23.8
Capital Goods	0.4	1.9	2.9	3.7	4.2
Mechanical	0.3	0.5	0.5	0.5	0.7
Electrical	0.1	1.0	1.4	1.6	2.1
Transport Equipment	0.2	0.4	1.0	1.6	1.4
Other	0.3	0.3	0.3	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0

Source: IBGE - Producao Industrial

Table 32 : GROSS VALUE ADDED IN MANUFACTURING INDUSTRIES, 1958, 1966-69

(In thousand 1971 Cr$)

	1958	1966	1967	1968	1969
Traditional Consumer Goods	1,336,202	1,677,101	1,660,468	1,821,015	1,872,837
Textiles	421,050	555,050	516,981	554,615	553,639
Clothing and Footwear	35,151	61,552	60,358	66,231	84,746
Food	670,628	741,540	737,734	806,837	843,806
Beverages	66,666	120,313	124,454	121,559	146,013
Tobacco	85,151	100,027	117,787	127,061	130,315
Printing and Publishing	32,727	65,291	68,988	76,406	73,936
Furniture and Fixtures	24,621	33,328	34,163	36,256	40,382
Intermediate Goods	561,814	1,239,346	833,281	1,067,580	1,201,150
Non-metallic Mineral	169,999	199,641	236,166	301,960	331,322
Metal Industries	38,409	113,190	98,475	134,091	165,242
Wood and Products	25,833	28,335	25,825	33,859	40,745
Paper and Products	19,242	19,871	36,189	30,694	30,166
Rubber and Products	4,697	9,812	10,426	10,813	13,063
Leather and Products	26,666	29,122	27,665	27,323	21,209
Chemicals	266,968	839,375	398,535	528,840	599,403
Capital Goods	6,712	63,330	101,801	128,948	161,920
Mechanical	2,803	20,074	20,878	19,042	29,044
Electrical	1,212	26,316	55,801	62,193	88,019
Transport Equipment	4,697	16,940	25,122	47,713	44,857
Other	2,272	10,751	10,132	5,306	6,885
Total	1,914,001	2,990,528	2,605,686	3,025,849	3,242,792

Source: IBGE - Produção Industrial.

Table 33 : EMPLOYMENT IN MANUFACTURING INDUSTRIES, 1955, 1966-69

(Thousand workers)

	1955	1966	1967	1968	1969
Traditional Consumer Goods	145,093	152,582	144,393	147,677	149,175
Textiles	61,426	52,120	46,935	49,523	46,846
Clothing and Footwear	7,100	6,070	6,542	7,433	8,759
Food	56,623	62,332	59,583	64,611	66,380
Beverages	4,558	10,261	8,935	8,129	8,795
Tobacco	5,256	11,000	9,592	7,052	6,689
Printing and Publishing	4,555	6,499	6,5[illegible]	6,826	7,134
Furniture and Fixtures	3,777	4,292	4,2[illegible]	4,304	4,372
Intermediate Goods	42,151	51,775	51,715	56,908	62,407
Non-metallic Mineral	17,737	1[illegible],260	16,87[illegible]	20,057	23,390
Metal Industries	3,467	5,543	6,972	8,719	9,707
Wood and Products	5,357	[illegible],[illegible]63	[illegible],052	4,614	4,829
Paper and Products	1,[illegible]6[illegible]	2,90[illegible]	2,559	2,733	2,704
Rubber and Products	282	6[illegible]1	019	958	1,096
Leather and Products	4,265	2,427	2,497	2,491	2,278
Chemicals	9,595	17,633	15,940	17,413	18,403
Capital Goods	1,270	4,117	4,094	6,734	7,617
Mechanical	407	1,292	1,389	1,653	1,997
Electrical	190	1,397	2,097	2,725	3,647
Transport Equipment	673	1,428	1,408	2,356	1,973
Other	1,168	1,093	981	1,034	793
Total	189,682	209,567	201,983	212,681	220,192

Source: Producao Industrial.

Table 34: [illegible] MANUFACTURING INDUSTRIES, 1958, 1966-69

(In thousand 1971 Cr$)

	1958	1966	1967	1968	1969
Traditional Consumer Goods	338,103	362,835	361,918	395,702	420,679
Textiles	121,650	119,521	113,177	121,405	123,423
Clothing and Footwear	13,256	13,982	15,069	19,167	23,848
Food	137,650	145,056	150,052	170,667	180,567
Beverages	13,106	29,883	28,881	30,050	33,288
Tobacco	11,970	19,924	19,517	17,389	16,198
Printing and Publishing	14,545	23,132	23,661	25,238	28,916
Furniture and Fixtures	9,921	11,337	10,961	11,786	12,439
Intermediate Goods	107,196	208,875	194,362	225,190	282,428
Non-metallic Mineral	35,530	46,182	52,267	64,682	71,351
Metal Industries	10,454	21,546	23,940	30,644	38,727
Wood and Products	9,242	8,623	9,569	11,295	13,678
Paper and Products	3,864	5,823	8,202	8,888	9,330
Rubber and Products	985	2,561	2,766	3,172	3,214
Leather and Products	11,136	6,503	6,702	7,184	6,892
Chemicals	35,985	117,437	90,916	97,325	139,296
Capital Goods	3,766	16,562	19,640	26,111	41,525
Mechanical	1,061	4,950	5,847	6,182	10,069
Electrical	682	6,117	7,801	10,907	18,460
Transport Equipment	2,045	5,595	5,992	11,022	12,996
Other	3,[illegible]	2,697	2,951	3,219	2,502
Total	[illegible]	591,969	578,871	650,222	749,134

Source: IBGE - [illegible] Industrial.

Table 35 : [illegible] 1966-69

	[illegible]	1966	1967	1968	1969
Traditional Consumer Goods	25.3	21.6	21.8	21.7	22.5
Textiles	32.7	21.5	22.0	20.8	22.3
Clothing and Footwear	37.7	22.7	25.0	28.1	28.1
Food	20.5	19.6	20.3	21.2	21.4
Beverages	19.7	24.8	23.2	24.7	22.8
Tobacco	14.1	19.9	16.6	13.7	14.0
Printing and Publishing	44.4	35.4	34.3	33.0	39.1
Furniture and Fixtures	40.3	34.0	32.0	32.5	30.8
Intermediate Goods	19.1	16.9	23.3	20.9	23.5
Non-metallic Mineral	20.9	23.1	22.1	21.4	21.5
Metal Industries	27.2	19.0	24.3	22.9	23.4
Wood and Products	35.8	21.1	37.1	33.4	33.6
Paper and Products	20.1	29.3	22.7	29.0	30.9
Rubber and Products	21.0	25.1	26.5	29.3	24.6
Leather and Products	30.4	22.3	24.2	26.3	32.5
Chemicals	13.5	14.0	22.8	18.4	23.2
Capital Goods	43.5	26.2	19.3	21.8	25.7
Mechanical	37.6	24.7	[illegible]	32.5	34.7
Electrical	[illegible]	23.2	14.0	17.5	21.0
Transport Equipment	[illegible]	[illegible]	[illegible]	23.1	29.0
Other	[illegible]	27.0	26.2	31.5	35.3
Total	[illegible]	19.8	[illegible]	21.5	23.0

Source: [illegible] Industrial [illegible].

Table 36 : GROSS VALUE ADDED PER EMPLOYEE, 1958, 1966-69

(In Cr$ thousand 1971)

	1958	1966	1967	1968	1969
Traditional Consumer Goods	9.2	11.0	11.5	12.3	12.5
Textiles	6.9	10.6	10.6	11.8	11.8
Clothing and Footwear	5.0	10.1	9.2	9.2	9.7
Food	11.4	11.9	12.4	12.5	12.7
Beverages	14.6	11.7	13.9	15.0	16.6
Tobacco	16.2	9.1	12.4	18.0	18.9
Printing and Publishing	7.2	10.0	10.5	11.2	10.4
Furniture and Fixtures	6.5	7.8	8.0	8.4	9.2
Intermediate Goods	13.3	23.9	16.1	18.7	19.2
Non-metallic Mineral	9.6	10.9	12.5	15.0	14.2
Metal Industries	11.1	17.0	14.1	15.4	17.0
Wood and Products	4.8	7.2	6.4	7.3	8.4
Paper and Products	12.9	9.9	14.1	11.2	11.2
Rubber and Products	16.6	11.7	12.7	11.3	11.9
Leather and Products	8.6	11.9	11.1	11.0	9.3
Chemicals	27.9	47.6	25.0	30.4	32.6
Capital Goods	6.8	15.4	20.8	19.1	20.7
Mechanical	6.9	15.5	15.0	11.5	14.5
Electrical	6.4	18.8	26.6	22.8	22.9
Transport Equipment	7.0	11.9	17.8	20.3	22.7
Other	6.2	9.6	10.3	7.7	8.7
Total	10.1	14.3	12.9	14.2	14.7

Source: IBGE - Producao Industrial

Table 37 : [illegible]

([illegible] Cr$ 1977)

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Traditional Consumer Goods	2.3	2.4	2.5	2.7	2.8
Textiles	[illegible]	2.3	2.2	[illegible]	[illegible]
Clothing and Footwear	[illegible]	2.3	2.3	[illegible]	2.7
Food	[illegible]	2.3	2.5	[illegible]	2.7
Beverages	[illegible]	2.9	3.2	3.7	3.8
Tobacco	[illegible]	1.8	2.0	2.5	2.6
Printing and Publishing	3.2	3.6	3.6	3.7	4.0
Furniture and Fixtures	2.6	2.6	2.6	2.7	2.8
Intermediate Goods	2.5	4.0	2.7	3.9	4.5
Non-metallic Mineral	2.0	2.5	2.8	3.2	3.0
Metal Industries	[illegible]	3.2	3.4	3.5	4.0
Wood and Products	1.7	2.2	2.4	2.6	2.8
Paper and Products	2.6	2.9	3.2	3.2	3.4
Rubber and Products	[illegible]	3.0	3.1	3.3	2.9
Leather and Products	[illegible]	2.7	2.7	[illegible]	[illegible]
Chemicals	[illegible]	6.7	5.7	5.6	7.6
Capital Goods	2.2	4.0	4.0	4.2	5.3
Mechanical	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Electrical	[illegible]	[illegible]	3.7	4.0	[illegible]
Transport Equipment	3.0	3.9	[illegible]	[illegible]	6.7
Other	2.3	[illegible]	2.7	[illegible]	3.2
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: IBGE - Produção Industrial.

Table 38 : [illegible]

	Share in Production (%)				Share in Employment (%)			
	1966	1967	1968	1969	1966	1967	1968	1969
Establishment employing -	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
6 to 19 workers	14.9	16.1	14.7	12.5	21.7	21.1	20.4	19.7
20 to 49 workers	11.4	12.4	11.2	11.5	11.0	11.2	10.9	11.2
50 to 99 workers	8.4	10.2	11.4	8.7	8.3	8.1	9.7	8.6
100 to 499 workers	31.5	29.8	37.1	37.9	32.5	35.9	35.7	35.4
500 and over	33.8	30.9	25.6	29.4	26.5	22.5	23.3	25.0

Source: IBGE - Producao Industrial.

Table 39: FIXED INVESTMENT IN MANUFACTURING INDUSTRIES, 1958-71

(In million 1971 Cr$)

	Total	SUDENE Sponsored
1958	137.6	-
1965	413.8	52.4
1966	403.1	172.7
1967	604.3	456.3
1968	931.0	839.6
1969	1,439.1	1,071.3
1970	n.a.	1,278.9
1971	n.a.	1,318.0

Source: SUDENE and BNB

Table 40: CHARACTERISTICS OF NORTHEAST TEXTILE INDUSTRY

AVERAGE AGE OF EQUIPMENT, 1959-69
(Percentage)

	Spindles		Looms	
	1959	1969	1959	1969
Up to 30 years	46	81	19	69
More than 30 years	54	19	81	31
	100	100	100	100
TOTAL (thousand)	(642)	(433)	(22)	(11)

PRODUCTIVITY, 1969
(Latin American Standard=100)

	SPINNING		WEAVING	
	Per Machine	Per Worker	Per Machine	Per Worker
Old Firms	71	80	66	36
New Firms	113	112	350	127
Brazil (1961)	64	46	54	30
Colombia (1962)	86	127	95	107
Western Europe (1965)	103	195	-	-
United States (1962)	-	288	-	-

EMPLOYMENT IN COTTON TEXTILE INDUSTRY, 1959-69

1959 Employment	32,573
1959-1969 Inflow	7,371
1959-1969 Outflow	9,334
(Modernization)	(6,698)
(Closing)	(2,636)
1959-1969 Net Outflow	1,937
1969 Employment	30,610

NORTHEAST TEXTILE INDUSTRY
ITS POSITION VIS-A-VIS BRAZIL, 1939-69

(Percentage Share)

	1939	1949	1959	1969
Employment	26.6	23.9	17.9	13.8
Wages	16.4	14.9	11.2	8.4
Production	17.4	17.2	16.3	10.9
Value-Added	17.7	16.4	13.9	9.8

Source: SUDENE

Table 13: HIGHWAY NETWORK BY REGION (KM), 1965-1970

Region		Total	Federal Highway			State Highway			Provincial		
		Total	Total	Unpaved	Paved	Total	Unpaved	Paved	Total	Unpaved	Paved
NE	1965	177,547	11,308	8,761	2,547	19,507	17,912	1,595	146,732	146,633	99 /1
	1970	280,009	14,911	8,659	6,252	27,344	24,442	2,902	237,754	237,492	262
	Increase	102,462	3,603	102	3,705	7,837	6,530	1,307	91,022	90,859	163
	% of National Increase	35	21	2	32	26	31	14	38	38	12
N	1965	7,745	1,772	1,510	262	2,463	1,777	686	3,510	3,403	107 /1
	1970	21,260	4,444	4,183	261	8,271	6,803	1,468	8,545	8,372	173
	Increase	13,515	2,672	2,673	1	5,808	5,026	782	5,035	4,969	66
	% of National Increase	5	16	50	0	19	21	8	2	2	5
C	1965	60,341	6,370	5,703	667	17,016	15,772	244	36,955	36,943	12 /1
	1970	91,597	3,742	8,313	1,429	22,327	21,652	675	59,528	59,522	6
	Increase	31,256	3,372	2,610	762	5,311	4,880	431	22,573	22,579	-6
	% of National Increase	11	20	48	7	17	23	4	9	9	-
S	1965	505,294	15,142	6,029	9,113	55,852	44,542	11,310	434,300	434,209	91 /1
	1970	646,913	22,443	6,239	16,204	67,392	49,039	18,383	557,078	555,830	1,248
	Increase	141,619	7,301	210	7,091	11,540	4,467	7,073	122,778	121,621	1,157
	% of National Increase	49	43	4	61	38	22	74	51	51	83
BRAZIL	1965	750,927	34,592	22,003	12,589	94,838	81,003	13,835	621,497	621,188	309 /1
	1970	1039,779	51,540	27,394	24,146	125,334	101,936	23,428	862,905	861,216	1,689
	Difference	288,852	16,948	5,391	11,557	30,496	20,933	9,593	241,409	240,028	1,380
	% of National Increase	100	100	100	100	100	100	100	100	100	100
	%	100	5			12			83		

/1 As of 1966

Source: DNER and Anuario Estatistico do Brazil (1971)

Table A2: [illegible] PERCENTAGE OF TOTAL NETWORK AND AVERAGE ANNUAL RATE OF GROWTH BY REGION, 1965-1970

Region		Total	Federal Total	Federal Paved	State Total	State Paved	Provincial Total	Provincial Paved
NE	1965	24	33	20	21	12	24	32
	1970	27	29	26	22	12	28	16
	Average annual rate of growth	9.5	5.7	19.6	7.0	12.7	10.1	21.6
North	1965	1	5	2	3	5	-	35
	1970	2	9	1	6	6	1	10
	Average annual rate of growth	22.4	20.2	0	27.4	16.4	19.5	10.1
Center	1965	8	18	5	17	1	6	4
	1970	9	18	6	18	3	7	-
	Average annual rate of growth	8.7	8.8	16.4	5.5	22.6	10.0	-
South	1965	67	44	73	59	82	70	29
	1970	62	44	67	54	79	65	74
	Average annual rate of growth	5.1	8.2	12.2	3.9	10.2	2.1	69.0
Brazil	1965	100	100	100	100	100	100	100
	1970	100	100	100	100	100	100	100
	Average annual rate of growth	6.6	8.3	13.8	5.7	11.1	6.8	40.5

Source: DNER and Anuario Estatistico 1971.

Table 43: RELATIONSHIP BETWEEN AREA, POPULATION, AND NUMBERS OF VEHICLES BY REGIONS 1970

Region	Area Sq Km	Population in thousands	Total vehicles(*)	Vehicle/ 1000 Sq Km	Vehicle/ 1000 Inhab.
North	3,578	3,515	33,638	9.4	9.6
%	42.1	3.8	1.0		
Northeast	1,546	29,074	310,452	200.8	10.7
%	18.2	31.1	9.0		
Center	1,880	5,052	126,531	67.3	2.5
%	22.1	5.4	4.0		
South	1,503	55,890	2,980,690	1,983.2	53.3
%	17.6	59.7	86.0		
Brazil	8,507	93,531	3,451,311	405.7	36.9
%	100	100	100		

* Estimates

Source: IBGE 1970 - Anuario Estatistics do Brazil 1971

Table 44: RELATIONSHIP BETWEEN AREA, POPULATION, AND LENGTH OF HIGHWAYS BY REGION, 1970

Region	Area in 1000sq.km	Pop.in 1000inh.	Pop. density	Total		Federal				State				Municipal	
				/1000sq.km	/1000inh.	km/ 1000sq.km	km paved/ 1000sq.km	km/ 1000inh.	km paved/ 1000inh.	km/ 1000sq.km	km paved/ 1000sq.km	km/ 1000inh.	km paved/ 1000inh.	km/ 1000sq.km	km/ 1000inh.
North	3,578	3,515	1.0	5.9	6.1	1.2	.07	1.3	.07	2.3	4.1	2.4	.4	2.4	2.4
Northeast	1,546	29,074	18.8	181.1	9.6	9.6	4.0	.5	.2	17.7	1.9	.9	.1	153.8	8.2
Center	1,880	5,052	2.7	48.7	18.1	5.2	.8	1.9	.3	11.9	.4	4.4	.1	31.7	11.8
South	1,503	55,890	37.2	430.3	11.5	14.9	10.8	.4	.3	44.8	12.2	1.2	.3	370.6	10.0
Grand Total	8,507	93,531	10.9	122.2	11.1	6.1	2.8	.6	.3	14.7	2.8	1.3	.2	101.4	9.2

Source: DNER, IBGE - 1971

Table 45: TRAFFIC MOVEMENTS ON FEDERAL AND STATE HIGHWAY NETWORK BY REGION, 1970

REGION	STATE	Truck Traffic '000 tons-km		Total Traffic in '000's Vehicle-km			Passenger movements Federal network in '000's pas. km		State network in '000's pas. km	
		FEDERAL	STATE	CAR	BUS	TRUCK	CARS	BUS	CARS	BUS
NE	MARANHAO	311.3	101.9	50.64	11.76	68.03	75.0	158.6	71.8	129.4
	PIAUI	128.0	10.9	9.70	2.66	18.94	24.6	56.0	3.5	9.0
	CEARA	479.5	91.1	38.81	6.72	73.56	74.5	134.9	37.9	29.5
	RIO GRANDE DO NORTE	166.0	52.8	29.48	4.48	32.62	58.4	77.0	26.9	32.8
	PARAIBA	462.8	146.3	120.93	17.85	101.06	238.4	313.1	112.2	124.1
	PERNAMBUCO	1954.5	664.7	355.91	62.55	368.67	639.5	1064.3	392.5	468.1
	ALAGOAS	733.7	280.3	77.89	13.22	132.69	152.8	209.5	73.0	114.3
	SERGIPE	494.4	138.5	63.28	8.13	80.60	134.9	158.5	48,5	40.6
	BAHIA	2712.0	865.6	285.13	59.53	434.68	568.3	1145.3	258.5	313.1
	TOTAL	7442.2	2352.1	1031.77	186. 9	1310.85	1966.4	3317.2	1024.8	1260.9
Center	MATTO GROSSO	1787.0	292.4	132.96	18.78	288.79	301.9	380.1	83.6	80.0
	GOIAS	805.6	256.5	201.95	32.35	159.44	441.0	665.3	144.6	127.2
	TOTAL	2592,6	548,9	334,91	51.13	448.23	742.9	1045.4	228.2	207.2
South	TOTAL, ALL STATES	42304,1	40145,7	10417,38	997,88	9380,41	18500,4	16443.4	11709.2	8004,1
	BRAZIL	52338,9	43046,7	11784,06	1235,90	11139,49	21209,7	20806,0	12962.2	9472.2

Source: SUDESL - DNER Traffic Survey 1970

Table 46: FEDERAL HIGHWAY INVESTMENT PROGRAM BY REGION, 1972-74

(in Cr$ million 1972)

Construction and/or paving					
Region	1972	1973	1974	Total 72-74	%
Northeast	614	369	441	1,424	25
Amazon Region	483	437	137	1,057	19
Rest of Brazil	881	1,061	1,232	3,174	56
Total	1,978	1,867	1,810	5,655	100

Source: DNER budget request March 1972

Table 47: FEDERAL HIGHWAY INVESTMENT PROGRAMS IN THE NORTHEAST (1972-74)

(In ~~Cr$~~ millions 1972, Construction and/or Paving)

BR	Sections	Length (km)	1972	1973	1974	Total	State
[illegible]	Picos-State Border PI/CE	85	-	4.5	-	4.5	PI
	BR 226-Fortaleza	278	4.0	17.0	22.9	43.9	CE
	State Border GO/BA-BR 242	225	-	-	10.0	10.0	BA
[illegible]	Brasilia-Campinho	1,096	6.6	9.9	13.9	30.4	BA
101	Natal-Parnamirim	20	1.5	1.5	-	3.0	RN
	Recife Boltway/	33	2.0	-	-	2.0	PE
	Maceio-State Border AL/SE	171	6.8	-	-	6.8	AL
	Sao Francisco Bridge	1	1.0	-	-	1.0	AL/SE
	Esplanade-BR 324	143	-	-	4.7	4.7	BA
	BR 324-Pedro Canario	802	254.1	34.6	-	288.7	BA
104	Campina Grande-BR 316	293	22.7	22.7	30.2	75.6	PB/PE
[illegible]	Areia Branca-Mossoro	48	-	2.0	4.0	6.0	RN
116	Ico-State Border PE/BA	275	2.4	-	-	2.4	PE/CE
135	Peritoro-Presidente Dutra	118	5.0	4.0	-	9.0	MA
	Presidente Dutra-Pastos Bons	178	-	-	12.0	12.0	MA
222	Sobral-Piripiri	200	28.2	-	-	28.2	CE/PI
226	Teresina-Presidente Dutra	220	4.2	4.2	-	8.4	RN
	Currais Novos-State Border RN/CE	219	-	3.0	15.0	18.0	CE
	Jaguaribe-Mineirolandia	145	-	.5	16.0	16.5	MA
227	Currais Novos-State Border RN/PB	150	.5	.5	-	1.0	RN
	State Border RN/PB-Pombal	38	.5	.5	-	1.0	PB
230	Pombal-BR 316	373	10.0	10.0	4.7	24.7	CE/PI
	Picos-Carolina	758	10.0	10.0	-	20.0	MA
232	Recife-Salgueiro	511	1.9	-	-	1.9	PE
234	Garanhuns-BR 316	124	-	11.6	22.7	36.1	PE/AL
235	BR 101-Ribeiropolis	61	5.5	5.5	7.4	18.4	SE
	SE 206-Carira	23	-	-	1.7	1.7	SE
242	Argoim-Barreiras	662	-	10.0	10.0	20.0	BA
304	State Border CE/RN-Acu	96	.5	-	-	.5	RN
316	State Border PA/MA-Peritoro	420	15.0	20.0	20.0	55.0	MA
	Rio Parnaiba Bridge	1	3.5	-	-	3.5	PI
	Teresina-Picos	316	15.7	7.0	1.0	23.7	PI
316/232	Picos-Salgueiro	297	35.3	35.4	47.1	117.8	PI/PE
316/234	Palmeiros cos Indios-P. Alfonso	184	-	2.6	32.0	34.6	AL
324	Feira de Santana-Salvador	108	67.0	2.5	-	69.5	BA
	North Access to Salvador	7	8.1	8.1	10.8	27.0	BA
[illegible]	Ubata-Ubaituba	29	-	5.0	6.0	11.0	BA
343	Luis Correa-Campo Maior	262	12.0	14.0	8.0	34.0	PI
[illegible]	Mossoro-BR116	97	-	2.3	1.0	3.3	RN
407	Picos-Petrolina	308	-	-	11.8	11.8	PI/PE
412/110	Farinha-Cruzeiro do Nordeste	203	-	-	8.8	8.8	
	TOTAL	9,576	504.0	248.7	321.7	1,074.4	
	Contribution of Special Program Provale Highway Program 2/		110.0	120.0	120.0	350.0	
	PROTERRA Northeast Highway Component 1/		(45.7)	(43.7)	(26.7)	(116.1)	
	PIN (Programa de Integracao Nacional) 1/		(45.0)	(72.5)		(117.5)	
	GRAND TOTAL		614.0	368.7	441.7	1,424.4	

Source: DNER budget request and mission estimate March 1972.

1/ Funds derived from PIN and PROTERRA are included in the above figures. They are, therefore, not double counted.
2/ Only the global figure is available. The breakdown is arbitrary.

Table 48: CLASSIFICATION BY FARMERS OF RURAL ROADS ACCORDING TO USABILITY DURING BAD WHEATHER, BY STATES AND TERRITORIES, 1965

State or Territory	Percent of Farmers Reporting Roads Impassable for...		
	Zero Days	1 - 60 Days	More Than 60 Days
Rondonia	78.83	5.43	15.74
Acre	45.81	27.55	26.64
Amazonas	68.91	7.63	23.46
Roraima	45.89	9.23	44.88
Para	82.61	3.70	13.69
Amapa	98.78	0.02	1.20
Maranhao	62.99	12.40	24.61
Piaui	70.40	18.07	11.53
Ceara	46.63	27.19	26.18
Rio Grande do Norte	62.23	23.54	14.23
Paraiba	63.60	23.37	13.03
Pernambuco	63.08	27.85	9.07
Alagoas	72.14	14.53	13.33
Sergipe	76.22	17.30	6.48
Bahia	71.28	21.94	6.78
Minas Gerais	62.25	23.80	13.95
Espirito Santo	66.02	26.37	7.61
Rio de Janeiro	56.92	20.52	22.56
Guanabara	97.93	1.76	0.31
Sao Paulo	73.80	18.65	7.55
Parana	72.42	20.26	7.32
Santa Catarina	69.38	22.34	8.28
Rio Grande do Sul	74.57	21.16	4.37
Mato Grosso	62.98	11.54	25.48
Goias	79.02	9.28	11.70
Distrito Federal	96.80	1.37	1.83

Source: IBRA, A Estrutura Agraria Brasileira, Volume 1, 1967.

Table 49: LENGTH OF THE RFFSA RAILWAY SYSTEM BY REGION, (Km), 1968-70

Regional Systems and Divisions	1968	1969	1970
Northeast			
Division Maranhao-Piaui	453	807	807
Division Cearense	1,734	1,379	1,379
Division Nordeste	2,781	2,726	2,726
Division Leste	2,470	2,436	2,436
Total	7,438	7,348	7,348
Central			
Division Centro-Oeste	3,461	3,711	3,663
Division Central	3,005	2,888	2,823
Division Leopoldina	2,467	2,467	2,396
Total	8,933	9,066	8,882
South-Central			
Division Santos-Jundiai	139	139	139
Division Noroeste	1,632	1,627	1,607
South			
Division Parana-Santa Catarina	3,055	3,055	3,052
Division Teresa Cristina	242	242	236
Division Rio Grande do Sul	3,245	3,652	3,653
Division Santa Catarina	180	184	184
Total	6,722	7,133	7,125
Total RFFSA	24,864	25,313	25,101

Source: Annual Statistics of RFFSA, 1971.

Table 53: TRAFFIC DENSITY IN THE NE RAILWAY SYSTEM, 1968-1970

Regional System	Passenger-km per route km (000)			Freight net ton-km (000)		
	1968	1969	1970	1968	1969	1970
Northeast						
1. Div. Maranhao-Piaui	35	36	30	27	20	15
2. Div. Cearense	99	120	121	78	101	118
3. Div. Nordeste	113	94	103	115	103	89
4. Div. Leste	69	90	97	80	102	130
Total	91	91	96	89	93	100
Central	747	717	661	650	727	805
Central South	1,212	1,027	925	656	658	626
South	75	73	71	302	407	431
RFFSA	402	375	347	410	448	480

Source: RFFSA, Anuario Estatistico, 1971.

March 1972

Table 51: PRELIMINARY 1972-74 INVESTMENT PROGRAM IN NORTHEAST RAILWAY SYSTEM

(in Cr$ million 1972)

Projects	Total	1972	1973	1974
A. New lines				
Iacu-Mapele and access to the port of Caboto	80	-	30	50
Iacu-Montes Claros	10	-	-	10
Spurline to Mataripe	5	-	5	-
Goianinha-Estivas	1	1	-	-
B. Communication and Personnel Reduction	5.7	1.5	2.1	2.1
C. Equipment for Storage and Stations	.6	-	.3	.3
D. Equipment for Halls and Terminals	1.1	.5	.3	.3
E. Modernization of offices	1.0	.1	.5	.4
F. Improvement of the network	174.9	60.2	62.2	52.5
G. Other investments	6.0	2.0	2.0	2.0
Grand Total	285.3	65.3	102.4	117.6

Source: RFFSA, March 1972

[illegible] OF THE MAIN NORTHEAST PORTS, 1960-70

(In 000's tons)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Sao Luis - Itaqui	n.a.	n.a.	n.a.	n.a.	196	264	280	190	318	356	315	277
Fortaleza (Mucuripe)	263	210	173	180	383	639	787	898	1,003	949	949	919
Areia Branca	279	234	232	163	167	174	269	298	361	312	n.a.	n.a.
Macau	270	356	451	461	331	341	324	421	306	445	n.a.	n.a.
Natal	157	199	100	105	83	136	155	169	186	169	148	n.a.
Cabedelo	226	256	213	176	158	224	211	142	288	285	234	n.a.
Recife	2,057	1,863	1,735	1,499	1,348	1,590	1,005	1,729	1,934	2,228	2,337	2,545
Maceio	n.a.	n.a.	n.a.	n.a.	128	298	427	147	570	660	828	n.a.
Aracaju	54	71	n.a.	18	3	33	122	627	1,072	1,518	1,584	n.a.
Salvador	1,457	1,869	989	850	491	528	982	623	506	736	552	667
Madre de Deus	-	-	-	-	-	3,970	5,230	5,761	5,987	5,872	n.a.	n.a.
Ilheus	n.a.	n.a.	n.a.	n.a.	71	143	202	28	100	153	287	n.a.

Source: Sunamam
Banco do Nordeste (Etene) 1971

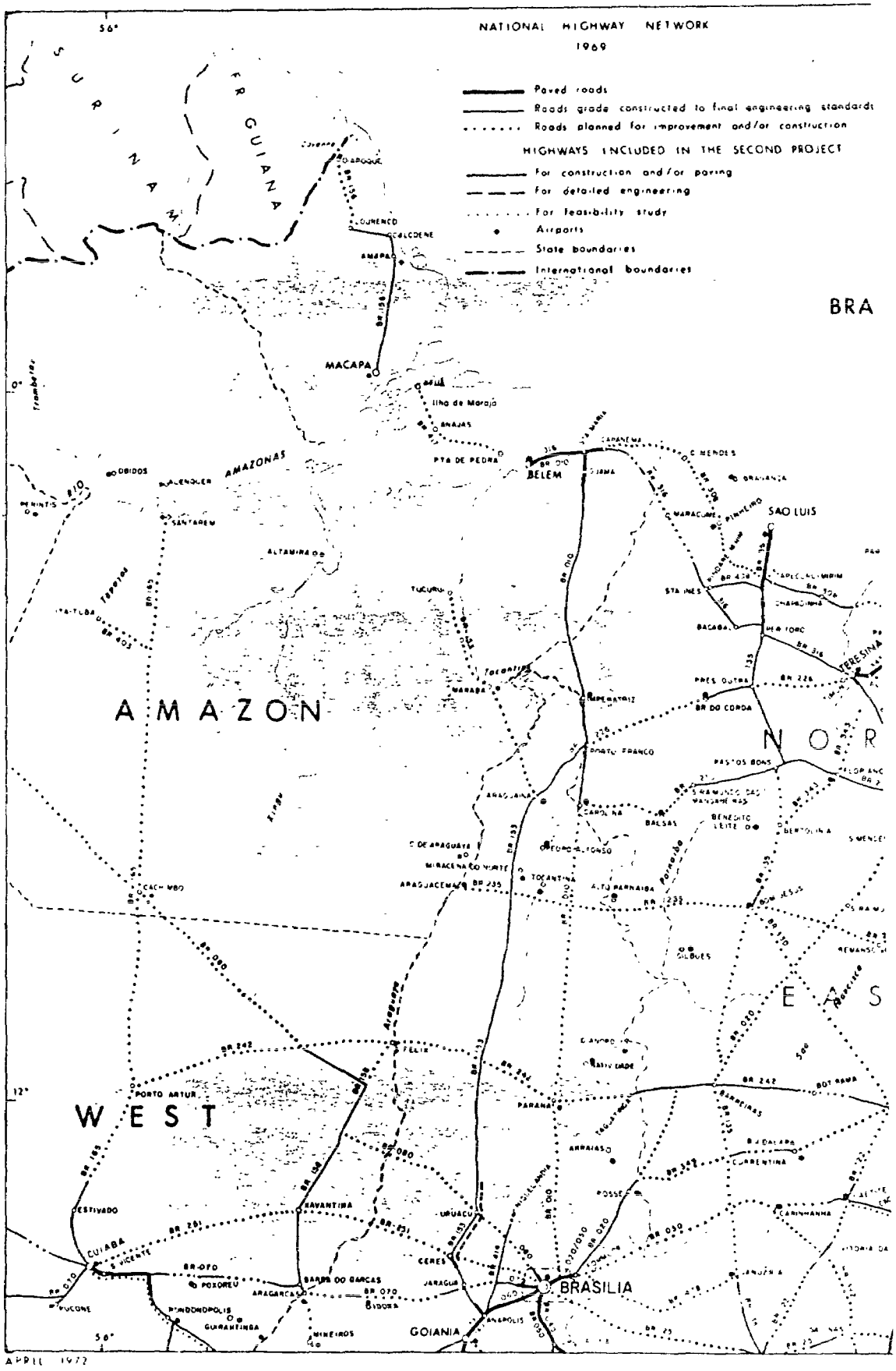
Table 53: PRELIMINARY FEDERAL HIGHWAY INVESTMENT PROGRAM IN THE AMAZON REGION, 1972-74

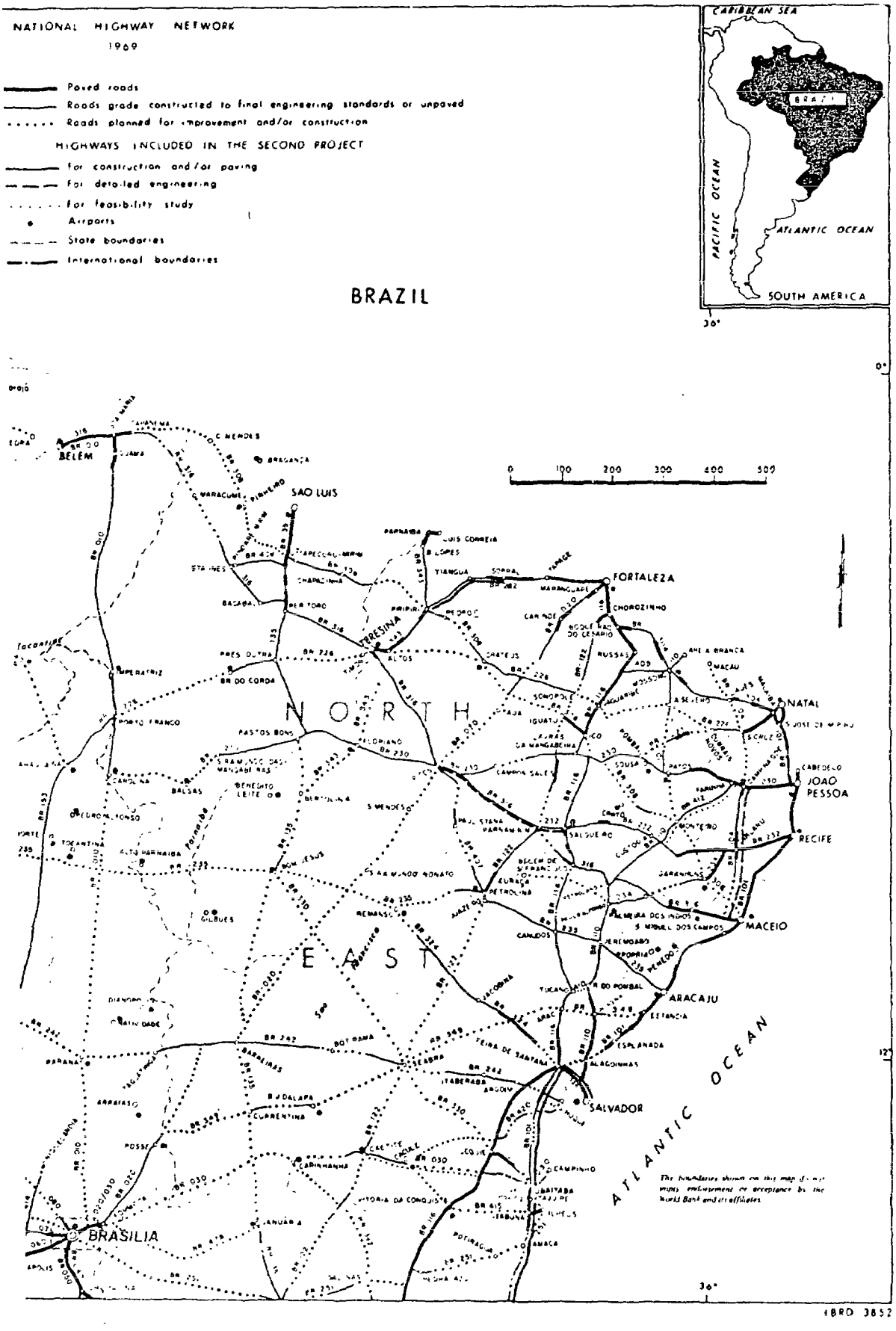
(In Cr$ million 1972)

Section		Length (In km)	1972	1973	1974	Total
A. Construction						
BR316	Belem-Sao Luis 1/	123	20	20	-	40
BR230	Transamazonia 2/	2,290	170	65	-	235
BR165	Cuiaba-Santarem	1,618	70	68	38	176
BR010/ 226/153	Belem-Brasilia 3/	1,452	128	157	35	320
BR174	Manaus-Venezuela 4/	1,200	13	26	23	62
BR319	Manaus-Porto Velho	866	31	48	8	87
BR317	Humaita-Labrea-Rio Branco	809	15	19	26	60
BR156	Macapa-Guyana	600 5/	6	6	7	19
BR236	Aluna-Peru	744	30	28	-	58
	TOTAL	9,702	483	437	137	1,057
B. Studies						
Perimetral Norte and links to Peru, Colombia, Surinam		4,400	4	4	-	8
	GRAND-TOTAL	14,222				1,065

1/ Includes only the section Capanema-Para State border (123 km).
2/ Corresponding to the section Estreito-Humaita.
3/ Corresponding to the section from Santa Maria to Porangatu.
4/ Including the section from Boa Vista to Guyana (BR-401).
5/ Estimate.

Sources: DNER budget request with some minor corrections.


NATIONAL HIGHWAY NETWORK
1969
Paved roads
Roads grade constructed to final engineering standards
Roads planned for improvement and/or construction
HIGHWAYS INCLUDED IN THE SECOND PROJECT
For construction and/or paving
For detailed engineering
For feasibility study
Airports
State boundaries
International boundaries
BRA
SURINAM
FR GUIANA
MACAPA
BELEM
SAO LUIS
AMAZONAS
A M A Z O N
N O R
E A S
W E S T
BRASILIA
GOIANIA
CUIABA
PORTO ARTUR
APRIL 1972


NATIONAL HIGHWAY NETWORK
1969
Paved roads
Roads grade constructed to final engineering standards or unpaved
Roads planned for improvement and/or construction
HIGHWAYS INCLUDED IN THE SECOND PROJECT
for construction and/or paving
for detailed engineering
for feasibility study
Airports
State boundaries
International boundaries
BRAZIL
CARIBBEAN SEA
BRAZIL
PACIFIC OCEAN
ATLANTIC OCEAN
SOUTH AMERICA
NORTH
EAST
ATLANTIC OCEAN
BELEM
SAO LUIS
FORTALEZA
TERESINA
NATAL
JOAO PESSOA
RECIFE
MACEIO
ARACAJU
SALVADOR
BRASILIA
0 100 200 300 400 500
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