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Rural Development Programs for Brazil's Northeast: An Interim Assessment

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AVERAGE EXCHANGE RATES

Cruzeiros/US$

1975	8.13
1976	10.67
1977	14.14
1978	18.08
1979	26.82
1980	52.81
1981	92.64

Source: Central Bank Bulletins

Preface

This report attempts to synthesize the economic and operational experience gathered by the World Bank during six years of active participation in rural development in Brazil's Northeast. It therefore relies heavily on the cumulative knowledge acquired by Bank staff, Government officials, academic researchers and others involved in carrying out rural development projects.

Several missions and desk studies were performed to distill the general body of wisdom into a readable report. These are as follows:

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ABBREVIATIONS AND ACRONYMS

BB	Banco do Brasil (Bank of Brazil)
BNB	Banco do Nordeste do Brasil (Bank of the Northeast)
BNCC	Banco Nacional de Crédito Cooperativo (National Cooperative Credit Bank)
BNDE	Banco Nacional de Desenvolvimento Econômico (National Bank for Economic Development)
CAP	Compra Antecipada da Produção (Guaranteed Crop Purchase Program)
CEPA	Comissao Estadual de Planejamento Agrícola (State Agricultural Planning Commission)
CEPLAC	Comissao Executiva do Plano de Recuperação da Lavoura Cacaueira (Executive Commission for the Plan for Recovery of Cocoa Cultivation)
CHESF	Companhia Hidro-Elétrica do São Francisco (Sao Francisco Hydroelectric Company)
CIDA	Companhia Integrada do Desenvolvimento Agrícola (State-owned Input Supply and Development Company)
CODEVASF	Companhia do Desenvolvimento do Vale do São Francisco (Sao Francisco Valley Development Company)
COLONE	Companhia do Colonização do Nordeste (Northeast Colonization Company)
CVSF	Comissao do Vale do São Francisco (Sao Francisco Valley Commission)
DER	Departamento de Estradas de Rodagem (State Highway Department)
DNOCS	Departamento Nacional de Obras Contra as Secas (National Department for Drought-Related Works)
EMATER	Empresa de Assisténcia Técnica e Extensão Rural (State Technical Assistance and Rural Extension Company)
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Company)
EMBRATER	Empresa de Assisténcia Técnica e Extensão Rural (Federal Technical Assistance and Rural Extension Company)

EMEPA	Empresa de Pesquisa Agropecuária de Paraiba (Paraiba Agricultural Research Company)
ENDEF	Estudo Nacional da Despesa Familiar (National Family Expenditures Study)
FINOR	Fundo de Investimentos do Nordeste (Northeast Investment Fund)
GECA	Grupo Especial de Coordinação e Acompanhamento (Special POLONORDESTE Interministerial Commission)
GEIDA	Grupo Executivo de Irrigação para o Desenvolvimento Agrícola (Executive Group for Irrigation for Agricultural Development)
GERAN	Grupo Especial para a Racionalização da Agroindústria Canavieira do Nordeste (Special Group for the Coordination of the Sugarcane Agroindustry of the Northeast)
GTDN	Grupo de Trabalho para o Desenvolvimento do Nordeste (Working Group for Northeast Development)
IAA	Instituto do Açucar e do Alcool (Institute of Sugar and Alcohol)
IBDF	Instituto Brasileiro de Desenvolvimento Florestal (Brazilian Institute for Forestry Development)
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)
INCRA	Instituto Nacional de Colonização e Reforma Agrária (National Institute of Colonization and Agrarian Reform)
IOCS	Inspetoria de Obras Contra as Secas (Inspectorate of Drought-Related Works)
IPA-PE	Instituto de Pesquisa Agropecuária de Pernambuco (Agricultural Research Company of Pernambuco)
MEC	Ministério de Educação e Cultura (Ministry of Education and Culture)
MINAGRI	Ministério da Agricultura (Ministry of Agriculture)
MINTER	Ministério do Interior (Ministry of the Interior)
OCEC	Organização das Cooperativas do Estado do Ceará (Ceara Organization of Cooperatives)
OME	Orgão Municipal de Educação (Municipal Education Unit)
PDRI	Projeto de Desenvolvimento Rural Integrado (Integrated Rural Development Project)

PIASS	Programa de Interiorização das Ações de Saude e Saneamento (Program for the Extension of Health and Sanitation Activities)
PIN	Programa de Integração Nacional (National Integration Program)
PNAD	Pesquisa Nacional por Amostra de Domicílios (National Household Survey)
POA	Plano Operativo Anual (Annual Operating Plan)
POLONORDESTE	Programa de Desenvolvimento de Áreas Integradas do Nordeste (Development Program for Integrated Areas in the Northeast)
PROAGRO	Programa Agrícola de Crédito (Crop Insurance Program)
PROALCOOL	Programa Nacional do Alcool (National Alcohol Program)
PROCANOR	Programa Especial de Apoio as Populações Pobres das Zonas Canavieiras (Special Support Program for the Poor in the Sugarcane Areas)
PROHIDRO	Water Resource Use Program
PROTERRA	Programa de Redistribuição de Terras e de Estímulo a Agro-Indústria (Land Redistribution and Agroindustrial Modernization Program)
SEC	Secretaria de Educação e Cultura (State Secretariat of Education and Culture)
SERTANEJO	Programa Especial de Apoio ao Desenvolvimento da Região Semi-Árida do Nordeste (Special Support Program for Development of Northeast Semi-Arid Region)
SEPLAN	Secretaria de Planejamento (State Secretariat of Planning)
SES	Secretaria Estadual de Saude (State Secretariat of Health)
SSE	Small-scale Enterprise
SUDENE	Superintendência de Desenvolvimento do Nordeste (Northeast Development Superintendency)
SUVALE	Superintendência do Vale do São Francisco (Superintendency for the Sao Francisco Valley)
UNO	União Nordestina de Assisténcia as Pequenas Organizações (Technical Assistance Union for Small Enterprises in Northeast Brazil)
UT	Unidade Técnica do POLONORDESTE (Technical Unit for Coordination of POLONORDESTE Projects)

SUMMARY AND CONCLUSIONS

i. The purpose of this report is to review the current federal programs for rural development and water resource use which are being used or could be used to help small farmers in Northeast Brazil. This assessment, interim in nature, is part of the continuing dialogue between the Government of Brazil and the World Bank on poverty alleviation and rural development strategies for the region, and on the nature and extent of the Bank's participation in rural development efforts in the next few years.

ii. These programs build on over 90 years of direct federal involvement in the region. The federal government has invested considerable resources and has tried many different strategies to stimulate development of the rural Northeast. Such diverse actions as massive dam-building and large irrigation projects, crop-specific support, promotion of agro-industry, and resettlement projects have been initiated. Initial efforts were based on the belief that the problem of the Northeast was the drought and that "drought-proofing" could be solved through engineering approaches. Gradually, however, the socio-economic origins of poverty became more widely acknowledged, and the problems of development accepted as more complicated. With the creation of SUDENE in 1959, regional planning and multi-sectoral development activities became the major focus of public policy. Industrialization emerged as the priority of the 1960s; it was not until the decade of the 1970s that rural development, with emphasis on the small producer and the use of a coordinated series of support activities, also received much attention.

iii. The results of these public interventions have been modest. Both inter- and intra-regional disparities persist. Per capita income in the Northeast in 1979 was about US$800, or 40% of the national average. Regional health, nutrition, and education attainment indicators also are below national levels, even though progress in reducing poverty in the region has been occurring, especially in the 1970s. Within the region, the rural population has lower earnings on average than the urban population, even after adjusting for income in kind, and also ranks lower on most social indicators.

iv. Raising the living standard of the small farmer by increasing his agricultural production capacity requires addressing several serious and often intractable problems. Yields of most export and basic food crops in the Northeast are lower than the yields prevailing in other parts of Brazil. Average yields have also been declining or have exhibited little improvement over the past decade. Although areas of fertile soils exist throughout the region, poor soils are widespread, and the low level, large variability, and uneven distribution of rainfall in much of the region limit agricultural possibilities. In addition, limited access to land restricts the income opportunities of the rural population. The region has a highly skewed land tenure structure, with many small subsistence farms coexisting with large farms devoted largely to plantation agriculture or cattle-raising. The 224 largest farms in the Northeast, each exceeding 10,000 hectares, control more land in absolute terms than the 1.7 million smallest farms, each with less than 10 hectares. Over the past two decades, there is some indication that the distribution of land has worsened and that land formerly available to sharecroppers and tenants has been put to other uses.

Program Experience to Date

v. POLONORDESTE, an integrated rural development program established in 1974, seeks to raise the productivity of small farmers by providing a variety of complementary investments and services. Program activities include investments for feeder roads, rural electrification, and storage facilities, as well as applied agricultural research, rural extension, subsidized credit, and funds for advance crop purchases. The program also provides complementary investments in social infrastructure (primarily health, education, and local water supply facilities), assistance to cooperatives and small non-agricultural enterprises, and land titling and purchase.

vi. POLONORDESTE has had mixed success to date in increasing productivity of small farmers. Extension, electricity distribution, school and road construction targets are being met more quickly than assistance to cooperatives and marketing organizations, construction and maintenance of health posts, and land titling, purchase, and redistribution. Coordinating the activities of many agencies at the federal, regional, state and local levels has been difficult; and providing services for which some agencies have little experience and learning to work with target groups who are not accustomed to receiving institutional assistance and credit have taken time. Funding has been erratic, due in part to reliance on PIN/PROTERRA funds (tax liabilities from industrial profits which are used for investments in specified regions), and delays in channeling budgeted funds to the projects have only recently been shortened. Extension, credit, and applied research appear to have contributed to yield and planted area increases; however, POLONORDESTE credit has been limited and lack of secure land tenure or clear land title has made it difficult for landless producers to obtain institutional credit of any kind.

vii. In spite of the start-up difficulties, POLONORDESTE is generally considered to be more successful than previous efforts to help the small producer, and implementation is expected to continue to improve. Nevertheless, the program cannot be expected to solve the problems of rural poverty in the region. There are about three million poor families in the Northeast; by 1980, the principal program benefits had gone to a small number of these families, probably to not much more than 100,000. Some expansion in coverage of families may be possible as costs per beneficiary decline, although some reduction in benefit levels may have to be accepted. The costs of learning, which have been high, now seem to be dropping, and the number, mix, and intensity of services offered to small farmers are being modified with experience and appreciation of budget and institutional constraints. For example, the cost per direct beneficiary was estimated at almost US$7,000 for the first six Bank-funded project loans. In contrast, the cost per beneficiary in the three most recent loans is estimated at US$3,400.

viii. The Sertanejo Project, intended to protect small and medium farmers in the semi-arid parts of the region against the periodic droughts, also involves a complementary set of assistance activities. Established in 1976, Sertanejo has been less successful than POLONORDESTE to date. Shortage of credit has been especially damaging, because credit is needed to finance the construction of small reservoirs, dams, and wells on the property of individual farmers. A substantial portion of the credit which has been available has gone

to farmers with 100 to 500 ha instead of to small producers, and many beneficiaries appear to be ranchers rather than farmers. However, Sertanejo has worked with some promising small-scale irrigation and water conservation techniques which could be put to more general use later.

ix. There are several water resource programs which also reach small farmers. Emergency drought relief, a popular program to offset the immediate effects of the drought, provides temporary employment, relief food supplies, and heavily subsidized credit. DNOCS, the principal anti-drought agency established in 1909, manages large-scale irrigation projects in the semi-arid parts of the region, and CODEVASF is responsible for irrigation projects in the São Francisco river valley. Thus far, the irrigation programs have been costly and have been more successful in constructing dams and reservoirs than in making use of the water to raise the production capability of small farmers. The high incomes predicted have materialized for only a small percentage of farmers. Irrigated land typically has not been used to produce high value crops, due to poor soils, lack of managerial capacity, inadequate training and on-going technical assistance, and difficulties with marketing.

x. The new water use program, PROHIDRO, established in 1979, holds the promise of helping small farmers and is officially viewed as complementary to the large irrigation programs, POLONORDESTE, and Sertanejo. It focuses on increasing availability of water to small and medium producers through the construction of reservoirs and wells; regulating the water flow in rivers to permit better agricultural use of the adjoining land; and a special credit line for the construction of small private wells and reservoirs. However, it is too early to discuss accomplishments.

Recommended Modifications

xi. POLONORDESTE, with its small farmer orientation and integrated approach, should continue to be supported. The program would be more effective, however, if the size of the project areas were kept small and were more sharply focused on areas with agricultural potential, and if the number of components were limited to those shown clearly to be needed and workable within institutional constraints. Sectoral projects might be used in conjunction with the integrated approach, when the issues involved -- such as recurrent cost funding for education and health -- could best be addressed at the state or regional level. Much more attention should be given to the small farmer's access to land and to water, which have been serious constraints in many projects.

xii. The Sertanejo program should be redirected to include small farmers as one of the primary target groups and to develop clear technical guidelines to assist intended beneficiaries. Greater complementarity between Sertanejo and POLONORDESTE would also make sense, especially in those geographical areas where program objectives are similar.

xiii. In general, little real coordination currently exists among the various rural development and water resource programs in the Northeast, despite their often common or complementary objectives, target populations, and, in many instances, geographic areas of operations. Closer coordination is warranted, and the merging of water resource and integrated development projects in common jurisdictions also merits serious consideration. The emergency drought relief program would be more effective if it were planned

in conjunction with the other special programs and its resources used for longer-term "drought-proofing" as well as temporary aid. At a minimum, better contingency planning is needed.

xiv. Small-scale irrigation is considered a promising vehicle for increasing the production of small producers and for insulating them from the periodic droughts. The Semi-arid Tropics Research program is experimenting with several small-scale irrigation models which are technically feasible but are currently too expensive and complicated to be adopted on a large scale. In the meantime, simple on-farm methods for utilizing existing water can be put to greater use. Installation of small community dams to serve 5-10 farms, pumping water from rivers and wells to the fields, and improved rainfed farming techniques are already being used in some locations and often do not require the organization, decisions on land and water rights, and large capital expenditures associated with the more formal irrigation systems.

Management and Administrative Structure

xv. Within each program, there is a strong need to strengthen management, planning, and evaluation capabilities both at the state and regional levels and to simplify administrative procedures. All of the special programs require the cooperation of several agencies. Therefore, the ability to redirect agency operations and train agency staff to deal with the objectives of the special programs is critical to the success of these programs. Similarly, the multi-agency nature of the programs makes program evaluation not only essential but also more complicated to undertake. In addition, the budgeting and accounting systems could be improved. Data were not available to the mission on the actual level of spending for the various programs. Many of the executing agencies do not exercise unit cost control, largely through lack of training compounded by the complications of rapid inflation. Finally, the large annual variations in budget allocations could be avoided if regular budgetary resources were used to supplement PIN/PROTERRA funds, which are now the major source of funds for the special programs.

Toward a Regional Strategy

xvi. Regional planning, like many of the special programs, is divided across agencies. Development objectives for the Northeast are not clearly defined, and the contribution of the special programs toward an overall strategy is somewhat vague. The special programs also are not coordinated with planning efforts at the state level. Even less coordination seems to have occurred between rural and urban development efforts in the Northeast. Yet the rural and urban sectors are intimately related. Poor opportunities in rural areas have stimulated rural-to-urban migration, and if present trends continue, unresolved problems in the countryside may ultimately be transferred to the cities.

xvii. While rural development projects as presently constituted can probably contribute to slowing down this migration, the relatively small population reached so far by these projects and the difficulties encountered in improving access to land suggest that this contribution is a limited one. What is most desired is a more comprehensive approach to development of the region. Rural development should include more attention to non-agricultural activities in rural areas, while large agro-businesses should be viewed as a source of rural employment as well as output. Encouraging industries which use local inputs and which are relatively labor intensive, such as those which process

agricultural products for export, would make use of the region's resources and provide a more diversified economic base for the region. Furthermore, the location of these activities in towns and small cities, where economically feasible, would link the rural and urban economies more closely. Agriculture is only part of the livelihood of most rural families; therefore, providing off-farm employment opportunities close to home would stabilize and perhaps raise family income. Industrial credit and FINOR funds (previously 34/18), which consist of liabilities applied to investments in industry in the region, could also be used more effectively to support industrial enterprises which use both labor and other local inputs.

CHAPTER I

INTRODUCTION

1.01 Since the late 1800s, the Northeast has been officially viewed as Brazil's foremost "problem area". The country's wealthiest region during the sugar boom of the colonial period, the Northeast subsequently lagged behind as industrial, agricultural, and commercial activity has shifted to the South. Wide inter-regional income and socio-economic disparities have persisted over many decades. Today, with nearly 30% of the nation's total population, the Northeast accounts for only 13% of the national product, and over 70% of the families in the region are considered poor.

1.02 Development assistance to the Northeast necessarily involves assistance to rural areas, where half of the region's population resides and where concentrated land ownership severely restricts access to land by the small farmer and severe droughts periodically rob families of their livelihood. The purpose of this report is to review the most important existing federal programs for rural development in Northeast Brazil. The major concern will be to examine the extent to which these programs are successfully meeting their targets and objectives and are contributing to the solution of the principal problems faced by the rural Northeast. This assessment is intended to serve as a basis for discussions between the Government and the World Bank on (i) the appropriate strategy for rural development in the Northeast, (ii) improvements in the implementation of the current special programs for the region, and (iii) the nature and extent of future participation by the World Bank in rural development efforts.

1.03 Two basic approaches to development in the rural Northeast are now in use. The first focuses on the integrated development of specific subregions. This approach, as exemplified by POLONORDESTE (Development Program for Integrated Areas in the Northeast), concentrates on increasing the production and productivity of small farmers by combining the provision of agricultural support services with physical infrastructure and social services. The second thrust of rural development policy is largely concerned with alleviating the effects of the recurring droughts which affect much of the region. This involves several complementary programs which attempt to provide temporary drought relief assistance and to increase and improve the use of scarce water resources. Specifically, these include the Emergency Drought Relief Program, several irrigation programs, the Sertanejo Project, the Water Resource Use Program, and the Semi-arid Tropics Research Program.

1.04 While the integrated rural development program and the drought relief/water resource use programs do not exhaust federal interventions in the Northeast, they do represent the principal official efforts both in terms of geographic coverage and the volume of resources allocated. For this reason, the report focuses on them, rather than attempting a comprehensive inquiry of all programs operating in the Northeast. However, the fiscal incentives available for large farming and ranching projects and a recently established initiative to assist the low-income population in the sugarcane zone are briefly discussed as part of the historical review of rural development policies. Regionwide sectoral programs for basic rural education and health services are mentioned briefly.

1.05 Although not all of the programs are directed exclusively to the small farmer, this report will concentrate on this target group. It is difficult to contemplate development of the region without increasing the productive capacity of small owner-operators, renters, squatters, and sharecroppers. At

most, only 30% of the Northeast's agricultural labor force owns land (see para. 2.31). Small farmers are also the principal producers of food crops in the Northeast; therefore, increasing their productive capacity is particularly crucial since production of several food crops in the region has grown very slowly over the past decade. Moreover, out-migration from the region has been substantial, especially during periods of drought. 1/ Although migration is beneficial to the extent that it improves the efficiency of regional and national labor markets, the speed and magnitude of migration out of the rural Northeast has undoubtedly strained the absorptive capacity of cities, especially those within the region. Improving the status of the region's poorer farmers, especially if they facilitate access to land, could slow migration to some degree and thus help reduce these urban strains. 2/

1.06 The World Bank has now acquired considerable experience with integrated rural development projects in the Northeast of Brazil. The intellectual underpinnings for this involvement were established in 1975, woth the production of a report entitled Rural Development Issues and Options in Northeast Brazil (World Bank Report No. 665s-BR). This earlier report provided an analysis of socioeconomic problems and trends, together with a discussion of development strategy options. Based on this analysis, the World Bank initiated a series of loans (nine to date) for integrated projects in the rural Northeast.

1.07 The present study is part of a broader effort by the Bank to provide greater support for rural development activities in the Northeast. In mid-1979, the Bank responded to a Government request for suggestions as to how rural development programs might be expanded and more effectively implemented during the upcoming years. The Bank at that time made a number of suggestions regarding changes in organizational structure and responsibility for Northeast rural development, and also proposed a variety of ways in which the Bank might intensify its own technical and financial collaboration with the Government. A long-term program of technical assistance through missions focusing on program implementation was identified as a useful Bank contribution, and the present report is part of that effort.

1.08 The report describes the region's present physical and socioeconomic situation and provides an historical overview of the evolution of federal government efforts to foster the development of the rural Northeast. The analysis of current federal interventions in rural areas (POLONORDESTE and the water resource programs) is necessarily an interim assessment because of the newness of some of the programs and lack of available data.

1.09 The material gathered for this report includes Government documents and interviews with Government officials, field staff, academic researchers, and farmers. Available statistics, program reports, and the literature on various aspects of the Northeast economy were also reviewed. With regard to the POLONORDESTE program, the mission prepared a questionnaire (see Annex 1) for project managers and conducted a seminar in Fortaleza, Ceara (February 19-20, 1981) to discuss project experience.

1/ Consequently, the rural population in the region has grown slowly, from 13 million in 1950 to 17 million in 1980.

2/ A recent study commissioned by SUDENE concluded that lack of access to land is by far the most important factor explaining emigration from rural areas of the Northeast. See SUDENE, Dinâmica das Microregiões de Intensa Atividade Migratória (Recife, 1980), Vol. 4.

CHAPTER II

THE REGIONAL SETTING

2.01 The objective of the present chapter is to describe briefly the physical and socioeconomic environment of the Northeast as a preface to the discussions of rural development policies and programs which follow. There is no attempt to be comprehensive, and heavy emphasis is placed on the current situation in the region's rural areas and, in particular, its evolution over the past ten years. The Northeast's industrial and urban sectors are touched upon only superficially, and the reader interested in details on these topics is advised to consult other sources. 1/

2.02 For purposes of this report, the Northeast is defined according to the geographic division of Brazil established by IBGE (Brazilian Institute of Geography and Statistics) in 1968. Thus defined, the region includes the states of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, and the Federal Territory of Fernando de Noronha (see Map No. 16017). The combined area is some 1.5 million square kilometers, or 18.2% of the country's total land area. 2/

2.03 The Northeast is extremely heterogeneous in terms of climate, topography, vegetation and economic and social characteristics.3/ The zona da mata, literally "forest zone", stretches along the coast from Rio Grande do Norte to southern Bahia in a narrow strip ranging up to 150 kilometers in width. The total land area of this sub-region is no more than 128,000 square kilometers, or about 8% of the region. However, it contains approximately one-third of the regional population, six of the nine state capitals and a major proportion of industry and plantation agriculture (largely sugarcane and cocoa). The ecological conditions of the zona da mata are generally favorable for agriculture, with soils of good natural fertility and abundant and regular rainfall (exceeding 2,000 mm per year in some areas).

1/ The literature on the history and development of the Northeast is especially rich. Some of the more useful works are: Manuel Correia de Andrade, The Land and People of Northeast Brazil (Albuquerque, N.M., 1979); Osmundo Rebouças et. al., "Desenvolvimento do Nordeste", Special Issue of Revista Econômica do Nordeste (April/June 1979); David Goodman and Roberto Cavalcanti, Incentivos a Industrialização e Desenvolvimento do Nordeste (Rio de Janeiro, 1974); and Albert Hirschman, Journeys Toward Progress (New York, 1973), Ch. 1.

2/ Two other concepts of the "Northeast" are sometimes used. The "drought polygon" (polígono das secas), used by DNOCS (National Department for Anti-Drought Works), covers the most drought-prone areas of the Northeast, including areas in the state of Minas Gerais; and has a land area of 1.8 million square kilometers. The second concept, adopted by SUDENE (Superintendency for the Development of the Northeast), encompasses the IBGE definition plus the portion of Minas Gerais falling within the "drought polygon". It has a total land area of 2.1 million square kilometers.

3/ Variations in rainfall and the various physical zones are shown on Map No. 15687.

2.04 The agreste is a transitional zone between the humid zona da mata and the semiarid sertão. Though its land area is about twice that of the zona da mata, its population is only 60% as large. Here one finds a landscape which can be highly variable over short distances with moist areas (brejos), generally of higher elevation, contiguous with semiarid areas covered with drought-resistant caatinga vegetation. Aside from the wet areas, annual precipitation, concentrated in the March-June period, is almost always less than 1,000 mm. The natural fertility of the soils is medium to low. The rural economy of the agreste is dominated by mixed farming for the domestic market as well as the raising of beef and dairy cattle.

2.05 The sertão, comprising some 750,000 square kilometers, is the largest of the sub-regions and the one most prone to periodic droughts. 1/ It encompasses the greater part of Ceara, Rio Grande do Norte, Paraiba, Pernambuco and Bahia and smaller portions of every other northeastern state except for Maranhão. However, its total population is only slightly greater than that of the zona da mata. Annual rainfall averages 700 mm for the sertão as a whole, but ranges from 250 mm in the driest areas to over 1,000 mm in the humid uplands. Various soils suitable for cultivation occur, but lithosols and regosols, poor for agriculture, are widespread. The variations in climate and soils permit a diverse rural economy with extensive cattle-raising and the extraction of drought-resistant plants (e.g., moço cotton, carnauba palm and oiticica nuts) predominating in the semiarid areas, and the production of fruits, vegetables, manioc, sugarcane and other crops in the cooler, more humid uplands.

2.06 The Middle North, comprised of Maranhão and most of Piauí, accounts for a fourth of the Northeast's land area and about a fifth of its population. In climatic terms, it is a transitional zone between the semiarid sertão to the south and west and the humid Amazon region to the north and east. Hence, annual precipitation ranges from less than 600 mm in eastern Piauí to more than 2,000 mm in northern Maranhão. The soils of the Middle North are varied, and some possess good natural fertility. Although Piauí and coastal Maranhão have been settled since colonial days, the central and western parts of the latter state are still in the process of frontier expansion. In the areas of older settlement, extensive cattle-raising and subsistence agriculture predominate, with significant palm-related extractive activities (based on carnauba wax and babaçu nuts) taking place in the lowlands of the Parnaiba River and in northeastern Maranhão. Rice is also an important cash crop. On the frontier, slash-and-burn agriculture followed by conversion to pasture is the traditional form of land use.

1/ Particularly severe droughts can also affect the agreste and even the zona da mata.

A. Population

Total Population Estimates

2.07 According to the preliminary results of the recent census, the population of the Northeast in 1980 was almost 35 million, or 29% of the national total (see Table 2.1). The region's average population density of 23 inhabitants per square kilometer was approximately 65% higher than that of the country as a whole. The average rate of population growth (net of migration) during the 1970-80 period was 2.2%, compared to the 2.5% annual rate estimated for Brazil as a whole. 1/ The 1970-80 rate represents a decline from the 2.4% annual growth of the 1960s and is about equal to that of the 1950s, a period of particularly intense out-migration.

Urban-Rural Distribution

2.08 The Northeast continues to be the most rural of Brazil's five macro-regions, containing some 45% of the country's rural inhabitants. Presently, the regional population is about equally distributed between urban and rural areas, with the former predominating slightly (see Table 2.1). However, a rural exodus of major proportions took place during the 1970s. 2/ Since 1970, population growth in rural areas has been negligible, and absolute declines may be noted in three states (Ceará, Rio Grande do Norte and Paraíba). Maranhão is the only state where the rural population has grown significantly, and this reflects its frontier status. Urban growth, on the other hand, has been pronounced in virtually every northeastern state, reaching 4.5% or more per year in four states (Alagoas, Ceará, Piauí and Maranhão). Preliminary estimates suggest that around 40% of the recent demographic growth of the Fortaleza and Salvador metropolitan areas was accounted for by migrants.

Migration to Other Regions

2.09 Out-migration is not a new phenomenon in the Northeast. Rural nordestinos, pushed by the effects of periodic droughts and insecure land tenure situations, have been leaving the region for many decades in search of better opportunities in the cities of the Northeast and Southeast or on the agricultural frontiers of Amazonia and the Center-West. As of 1970, some 3.5 million persons born in the Northeast were living elsewhere, the vast majority in the metropolitan areas of São Paulo and Rio de Janeiro. Seasonal migration, both inter- and intra-regional, is also important.

1/ The slow growth of the Northeast relative to Brazil is a continuation of a trend observed in all previous census periods, starting in 1872 when the region accounted for nearly half of the country's population.

2/ This observation also applies to Brazil as a whole. According to preliminary 1980 census tabulations, the rural population fell in absolute terms over a census period for the first time in the country's history.

Table 2.1

NORTHEAST REGION: POPULATION GROWTH, 1970-80

State	1980 Population ('000s)			1970-80 Growth (% p.a.)		
	Total	Urban	Rural	Total	Urban	Rural
Maranhão	4,002.6	1,257.1	2,745.5	2.9	5.3	2.1
Piauí	2,140.o	898.0	1,242.1	2.4	5.3	0.8
Ceará	5,294.9	2,814.2	2,480.7	1.9	4.7	-0.4
Rio Grande do Norte	1,899.7	1,115.6	784.1	2.0	4.2	-0.4
Paraíba	2,772.6	1,450.3	1,322.3	1.5	3.8	-0.4
Pernambuco	6,147.1	3,785.7	2,361.4	1.8	3.0	0.0
Alagoas	1,987.6	978.6	1,009.0	2.3	4.5	0.5
Fernando de Noronha	1.3	1.3	-	0.2	0.2	-
Sergipe	1,141.8	618.3	523.5	2.4	4.1	0.8
Bahia	9,474.3	4,666.4	4,807.9	2.4	4.2	0.9
NORTHEAST	34,861.9	17,585.6	17,276.3	2.2	4.1	0.5

Source: IBGE.

2.10 Though the census data released so far are not sufficient to calculate the exact dimensions of the major migratory flows, it is possible to estimate rough orders of magnitude by making certain assumptions about the Northeast's underlying rate of natural population growth. Assuming a plausible 2.8% natural growth rate, the net migration from the region during the 1970s must have been in the neighborhood of 2.2 million. 1/ (This may be compared with an out-migration of 1.2 million persons in the previous decade). 2/ Of the nine states, it is probable that only Maranhão had a positive net migratory balance. At the other extreme, the state of Pernambuco is likely to have had a negative balance of around 620,000, equivalent to 12% of its 1970 base population.

B. Dimensions of Poverty

2.11 In spite of public policies and rapid growth over the past decade, there remains a wide socioeconomic gap between the population of the Northeast and that of Brazil generally. As of 1979, the per capita income of the Northeast was almost US$800, or approximately 40% of the national average. 3/ Over 70% of all northeastern families earned, including income in kind, two minimum wages (equivalent to US$321 per capita) or less in 1979. In contrast, only about 40% of the families residing in the rest of the country earned such low incomes. The region also lags in terms of health, nutrition, and educational attainment (see Table 2.2).

2.12 On average, the rural population of the Northeast has a lower standard of living than the urban population. Though complete data on urban and rural incomes are not available for recent years, a Bank report, employing data from the 1974-75 National Family Expenditure Study (ENDEF), classified 62% of northeastern rural families as poor, versus 38% of the urban families. 4/ More recent partial data are consistent with this finding. Information drawn from the 1978 National Household Survey (PNAD), for example,

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1/ It is assumed that the decline in the natural growth rate observed at the national level has occurred in the same proportion in the Northeast. More precise calculations will only be possible when the full census is published.

2/ The estimated rise in out-migration during the 1970s is probably related to the effects of two severe droughts (1970 and 1979-80) and one partial drought (1976) which occurred during the period. The 1960s, with the exception of a partial drought in 1966, were virtually drought-free.

3/ If the Northeast were a country, it would be the second most populous (after Brazil) and, measured by average per capita income, the fourth poorest (after Bolivia, Guyana and Peru) in South America.

4/ The "poverty line" was defined as two minimum wages. See G. Pfeffermann and R. Webb, "The Distribution of Income in Brazil", World Bank Staff Working Paper No. 356 (September 1979), p. 100.

Table 2.2

NORTHEAST AND REST OF BRAZIL: SELECTED SOCIOECONOMIC INDICATORS, 1979 or 1980

I N D I C A T O R	NORTHEAST			REST OF BRAZIL		
	Region	Urban	Rural	Region	Urban	Rural
Per Capita gross domestic product (current US$): 1979	793	n.a.	n.a.	2,002 a/	n.a.	n.a.
Poverty Families (% total families): 1979 b/	74	n.a.	n.a.	42	n.a.	n.a.
Infant Mortality: 1978-74 c/	122	n.a.	n.a.	89 a/	n.a.	n.a.
Adequate Diet (% total population):1974-75 d/	21	9	30	38	28	58
Access to Sanitation (% total population): 1980 e/	48	78	17	87	95	64
Literacy (% population > 5 years): 1980	48	64	31	77	82	61
Primary School Participation (% pop. 5-14 yrs.): 1979	70	89	55	82	89	65

a/ Data refer to national average.

b/ Families earning the equivalent of two or less minimum wages per month, including income in kind.

c/ Deaths of infants aged 0-12 months per 1,000 live births.

d/ Diet satisfying FAO/WHO low calorie requirements.

e/ Population of homes with any sanitary device (latrine, septic tank, etc.)

Sources: SUDENE, Produto e Formação Bruta de Capital, 1965-79 (Recife, 1980); Conjuntura Econômica, 1981; IBGE, Metodologia da Pesquisa Nacional por Amostra de Domicílios na Década de 70 (Rio, 1981); World Bank, Brazil Human Resources Special Report (Washington, 1979); Tabulações Avançadas do Censo Demográfico, 1980, Vol.1 (Rio, 1981).

Table 2.3

NORTHEAST AND CENTER-SOUTH: TRENDS IN SELECTED SOCIOECONOMIC INDICATORS, 1970-79/80[a/]

I N D I C A T O R [b/]	NORTHEAST			REST OF BRAZIL		
	Region	Urban	Rural	Region	Urban	Rural
Per Capita Income (1970-79)	+ 84	n.a.	n.a.	+ 70 [c/]	n.a.	n.a.
Infant Mortality (1965/70-1973/74)	- 10	n.a.	n.a.	- 12	n.a.	n.a.
Access to Sanitation (1970-80)	+ 19	+ 17	+ 11	+ 13	+ 3	+ 25
Literacy (1970-80)	+ 9	+ 5	+ 6	+ 8	+ 3	+ 11
Primary School Participation Rate (1970-79)	+ 12	- 2	+ 19	+ 4	- 5	+ 9

a/ Data are expressed in percentage points change over period; except for per capita income and infant mortality which are expressed as percent change over period.

b/ Definitions of indicators are given in Table 2.2.

c/ Data refer to national average.

Sources: See Table 2.2.

shows that while 49% of the Northeast's industrial labor force earned less than one mininum wage, including income in kind, the analogous figure for agricultural workers was 85%. With the exception of nutritional standards, the rural population lagged behind urban levels for all other social indicators for which an urban-rural comparison was possible. Moreover, the data in Table 2.2 clearly suggest the existence of a large deficiency in social infrastructure and services in the rural Northeast.

Progress During the 1970s

2.13 Although the socioeconomic gap between the Northeast and rest of Brazil is still large, substantial progress in reducing poverty in the region has been achieved in recent years. Over the decade, the Northeast per capita income, according to preliminary estimates, increased by some 84% in real terms and, in the aggregate, important gains may be noted in average health and education standards. Table 2.3 shows the trends in the 1970's. Though there is some divergence between trends at the urban and rural levels, all indicators, except for the urban primary school participation rate (which is probably down because of large rural-to-urban migration), show improvement.

2.14 The recent socioeconomic progress of the Northeast compares favorably with that attained in the rest of the country. In fact, per capita income increased faster in the region than in Brazil generally, in large part because population growth in the region was lower than that of the country as a whole (2.2% and 2.5%, respectively). As a consequence, the Northeast/Brazil per capita income ratio (the one most commonly used to measure interregional disparities) rose from 37% in 1970 to 40% in 1979. (It should be noted, however, that the 1979 ratio is no higher than analogous ratios calculated for the mid-1960s). Trends in the Northeast and the Center-South with respect to the other indicators in Table 2.3 are, at least in the aggregate, remarkably similar.

2.15 In the absence of comparable time-series data on urban and rural per capita incomes, it is not possible to reach a conclusion on trends in intraregional disparities. But a comparison of daily wage rates prevailing in urban and rural areas shows a converging trend over the decade, especially since 1973 (see Table 2.4).

Table 2.4

NORTHEAST REGION: RATIO OF RURAL TO URBAN DAILY WAGE RATE, 1970-79 *
(%)

1970	.62	1975	.92
1971	.58	1976	.91
1972	.59	1977	.96
1973	.66	1978	.91
1974	.83	1979	.99

* Rural wage refers to casual daily worker (trabalhador eventual); urban wage refers to unskilled construction worker (servente).

Source: IBGE.

2.16 Since we are dealing with the relative behavior of wage rates, it cannot be inferred from these data that average rural incomes rose relative to urban incomes, because of probable differences in the average time worked in the two sectors. However, it may be hypothesized that regional labor markets became increasingly "homogenized" over the period. 1/ A number of factors could explain this convergence or "homogenization" but, given the stagnation of the region's agricultural production in the last half of the 1970s (see para. 2.23) and the recent drought, it would appear that constraints on the supply of rural labor were the most important. This hypothesis is consistent with the high rates of interregional and rural-to-urban migration estimated for the period.

C. The Rural Economy 2/

2.17 As of the late 1970s, agriculture provided employment for some 6.6 million persons, or 54% of the regional labor force. Between 1970 and 1979, real value-added in agriculture increased at an average annual rate of 4.9%, a rate almost identical to that achieved by all Brazilian agriculture over the same period. However, virtually all of this agricultural growth took place in the first half of the decade; from 1975 to 1979 real value-added in agriculture stagnated. In addition, year-to-year changes in production levels, owing primarily to climatic variations, have been very erratic, thus introducing an undesirable degree of instability into the rural economy. Both aspects are shown in the following table.

Table 2.5

NORTHEAST REGION: GROWTH OF REAL VALUE-ADDED IN AGRICULTURE, 1970-79

Year	Index (1970 = 100)	% Change	Year	Index (1970 = 100)	% Change
* 1970	100.0	-15.6	1975	176.7	24.9
1971	136.0	36.0	* 1976	151.3	-14.4
1972	144.6	6.3	1977	174.2	15.1
1973	153.8	6.4	1978	178.9	2.7
** 1974	141.5	-8.0	* 1979	175.8	-1.7

* Drought year.
** Flood year.

Source: SUDENE.

1/ A similar phenomenon was also noted in the Pfeffermann-Webb study, op. cit.

2/ See Gary P. Kutcher and Pasquale L. Scandizzo, The Agricultural Economy of Northeast Brazil (Baltimore, 1981) for an introduction to the rural Northeast.

2.18 The agricultural sector, however, is characterized by low labor productivity; in 1979, agriculture accounted for only 16% of the regional product. In addition, average crop yields are among the poorest in Brazil. Attempts to increase regional production and productivity are constrained by a multitude of factors, including, inter alia, a relatively poor natural resource base, a concentrated pattern of land ownership, inadequate agricultural research and extension, inefficient marketing networks and limited access, especially on the part of poorer farmers, to rural credit and social services.

Crop Production and Yields

2.19 In recent years, the Northeast has accounted for about 22% of the value of national crop production and many regionally-produced commodities loom large in Brazil's totals. Included among these are (percent of national total in parentheses): sisal (100%), cocoa (96%), coconut (95%), pineapple (50%), manioc (41%), bananas and sugarcane (about 40% each), and cotton (35%).

2.20 At the regional level, crops are the mainstay of the rural economy, accounting for about 70% of the primary output. 1/ The present structure of production is such that domestic food crops are about equal in value to industrial/export crops. This relationship has changed little over the past 15 years, although individual crops have risen (e.g., manioc and cocoa) or fallen (e.g., corn and cotton) in relative importance over the period. In the domestic food crops category, manioc and beans predominate while cocoa, sugarcane and cotton are the most important industrial/export crops.

2.21 By and large, the yields of crops grown in the Northeast are low by international standards as well as by standards prevailing in other parts of Brazil. The latter is made clear in Table 2.6, which compares recent average yields in the Northeast to those attained in the Center-South. Even more significant, however, is the fact that average yields for many regional crops have stagnated or declined over the past decade.

Table 2.6

NORTHEAST AND CENTER-SOUTH REGIONS: COMPARATIVE YIELDS OF SELECTED CROPS, 1977/79

	N.E. (MT/ha)	N.E. as % of C-S
Beans	0.4	62
Corn	0.6	35
Manioc	10.6	77
Rice	1.3	95
Cotton	0.2	15
Sugarcane	47.9	83

Source: IBGE.

1/ Most of the balance is accounted for by livestock. However, owing to the dearth of reliable statistics on this important sub-sector, little is known about recent trends in output and productivity.

2.22 The relative importance of average yields as determinants of production gains is shown in Table 2.7. Here the production trends of seven crops (accounting for approximately 83% of total regional crop value) are disaggregated to their yield and area components. It is obvious from these calculations that, with the exception of cocoa, expansion of the cultivated area was the prime factor contributing to output growth during the 1970s. 1/ Particularly worrisome are the negative yield trends and stagnating production of basic food crops such as beans, corn, and manioc. These crops, which have historically been highly vulnerable to drought, are mainly cultivated on small holdings and constitute an important part of the diets of poverty groups. 2/

Table 2.7

NORTHEAST REGION: TRENDS IN PRODUCTION, CULTIVATED AREA AND YIELD, SELECTED CROPS, 1969/71-1977/79

(Average growth per annum)

Crop	Production	Area	Yield
Basic Food Crops			
Beans	-0.3	3.6	-3.8
Corn	0.9	2.9	-1.9
Manioc	0.9	3.1	-2.1
Rice	4.4	3.6	0.8
Industrial/Export Crops			
Cocoa	4.1	-0.2	4.3
Cotton	-2.9	0.1	-3.0
Sugarcane	7.1	5.9	1.1

Source: IBGE.

1/ This seems to have been the case over most of the postwar years not only in the Northeast, but in Brazil generally. For similar calculations covering the Northeast in the 1948-69 period, see: G. Patrick, Desenvolvimento Agrícola do Nordeste (Rio de Janeiro, 1972), Ch. 3. Calculations for Brazil as a whole are presented in: A Review of Agricultural Policies in Brazil (IBRD Report No. 3305-BR).

2/ It is not clear whether the slow growth of food crops has had an appreciable effect on retail prices. Price indices exist for Recife and Salvador but they only start in 1977. Moreover, they show different patterns -- food prices have been increasing much faster than the general index in Recife but a bit slower in Salvador.

2.23 In the case of basic food crops such as beans and manioc, the declines in yields may be traced to such factors as displacement of plantings to less fertile areas, lack of improved varieties at the farm level and the almost total absence of modern inputs in the production process. The recent performance of cocoa is a notable exception, and improvements in average yields for this commodity are no doubt attributable to the work of CEPLAC (Executive Commission for the Plan for Recovery of Cocoa Cultivation), a well-financed agency which has promoted research on new varieties and provided credit and technical assistance to farmers and cooperatives.

D. Principal Rural Development Constraints

Resource Base

2.24 Soils. Though areas of fertile soils exist throughout the region, the available data indicate that poor soils are widespread and, as such, constitute an important limitation to agricultural development. Table 2.8, which classifies the land of the Northeast in terms of its agricultural aptitude, shows that with traditional management practices (i.e., no fertilizer use or mechanization) only 10-15% of the region's land has good or moderate agricultural potential. This proportion rises somewhat when modern management practices are employed, but still remains at 30% or less. In contrast, about 20% of the soils in the South (Paraná, Santa Catarina and Rio Grande do Sul) are good or moderate under traditional technology, a proportion which rises to 50% under modern practices.

2.25 There is some evidence to suggest that a significant proportion of regional agriculture is carried out on the poorer soils. According to one estimate, 60% of the area devoted to annual crops in Ceará, Rio Grande do Norte, Paraíba and Pernambuco is comprised of soils classified as unsuitable for agriculture. 1/ Though the factors causing agriculture to be carried out on inappropriate soils are not entirely evident, it may be hypothesized that population growth, increasingly concentrated land ownership, incentives for producing export crops and (to an increasing extent) for cattle raising in areas with better soils, the extensive pattern of post-war agricultural growth and the very scarcity of good soils itself have contributed to the movement of basic food crop production to less productive areas.

2.26 Climate. The principal climatic constraints on agricultural development are the droughts which, on the average, afflict the Northeast every 8-10 years. Since 1900, there have been 12 such droughts, the most recent occurring in 1979-81. Droughts may differ considerably in duration (1-3 years), area affected and severity. In terms of production results, the distribution of rainfall over the critical months of the crop cycle is as crucial as the

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1/ R.M. Paiva, A Agricultura no Desenvolvimento Econômico (Rio de Janeiro, 1979), p. 68.

TABLE 2.8

NORTHEAST REGION: AGRICULTURAL APTITUDE OF SOILS

(% of total land area)

Aptitude	Potential Suitability of Total Land Area For Annual Crops		For Perennial Crops	
	T	M	T	M
Good	0.3	0.6	0.5	1.3
Moderate	8.0	20.1	3.3	10.6
Restricted	31.9	20.8	25.4	20.7
Unsuitable	59.8	58.5	70.7	67.4

Note : T = traditional technology

M = modern technology (i.e., use of fertilizers, mechanization).

Source: Ministério da Agricultura (SUPLAN), Oferta e Demanda de Recursos de Terra no Brasil (Brasilia, 1975).

total amount. For example, in Rio Grande do Norte, rainfall must exceed 100 mm in both March and April and 40 mm in May to permit normal crop yields. If, as in the case of a "severe" drought, annual rainfall exceeds 250 mm but is less than the required minimum in two of the three critical months, cotton production is likely to fall to 50% of a normal year output and subsistence crops to 10-30%. 1/

2.27 The most visible effects of a drought are crop failures and animal losses, frequently accompanied by widespread unemployment, temporary or permanent emigration and occasional social disorders. In the past, droughts even caused major losses of life as in 1877-79, when an estimated 500,000 persons died from hunger and disease. Though droughts inevitably bring both financial and human losses to the Northeast, the burden of these losses is not distributed equally among crops and categories of producers.

2.28 The crops hardest hit by droughts are usually cotton and subsistence food crops. In the drought year of 1979, for example, when overall agricultural production in the Northeast fell by 1.7%, the production of cotton, corn, beans and rice fell by 29%, 16%, 8% and 7%, respectively. In contrast, sugarcane and cocoa, largely grown in the drought-free zona da mata, increased by 5% each. Though production declines in drought years may be largely offset by rising prices, 2/ this is of small comfort to the unemployed and to farmers who have lost most or all of their crops (which may be the farm families' own main source of food).

2.29 During the 1970 drought, about three-fourths of the recruits on the public "work fronts" (frentes de trabalho) were sharecroppers and small owner-operators. 3/ There are a number of reasons why these types of producers are probably hurt most by the drought, but the most important is that sharecroppers and small-holders are the most dependent on traditional food crops for their incomes and on-farm consumption and generally lack alternative resources necessary to sustain themselves and their families until the next normal crop year. Thus, the drought is as much a socioeconomic problem as a climatic one.

Land Tenure

2.30 Insecurity of tenure. Lack of access to land on a secure basis is generally considered one of the most important barriers to agricultural development in the Northeast. Landless producers are among those least able to protect themselves from the effects of droughts and are also at a considerable disadvantage when seeking access to rural credit (especially for on-farm

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1/ It should also be pointed out that, owing to the low water retention capacity of soils in drought-prone areas, excessive rainfall frequently causes flooding and widespread damage.

2/ In Pernambuco in 1979 the nominal farm-gate prices of cotton, corn, beans and rice rose by 72%, 78%, 88% and 73%, respectively, while the consumer price index for Recife rose by 63%.

3/ At the time, sharecroppers and small owner-operators accounted for only about 25% of the agricultural work force in the sertão.

investment), extension services, and the benefits of rural labor legislation. For these reasons and, in the case of temporary workers, because of wide seasonal variations in employment, the landless are undoubtedly the poorest segment of the rural work force, the most difficult to assist, and the most likely to emigrate.

2.31 Unfortunately, the agricultural census does not provide adequate data for calculating the number of landless producers. However, the SUDENE/IBRD survey of 8,000 farms conducted in 1973-74 found that only 13% of the sample's labor force owned land, a percentage which rose to 30% when family workers were included. Moreover, nearly half of the agricultural labor force was found to be comprised of temporary workers with no continuous access to land.

2.32 There is some uncertainty over recent trends regarding security of tenure, and much more research on this topic is needed before firm conclusions can be reached. Many Brazilian authors, however, have argued that in certain sub-regions of the Northeast insecurity of tenure has increased significantly in recent years. 1/ In the agreste, for example, it is argued that the expansion of cattle-raising at the expense of crops has caused the expulsion of numerous sharecroppers -- a process known as "pecuarização". This process is said to have accelerated since the 1960s owing to the rising prices of beef cattle vis-a-vis traditional crops, 2/ fears on the part of landowners of an agrarian reform that would provide titles to sharecroppers and tenants, and the development of planted pastures (in contrast to feeding cattle on the residue of corn and cotton left by sharecroppers) encouraged by fiscal incentives and highly subsidized credit. 3/

1/ See, for example, Andrade, op. cit.; and two papers by Ricardo Carneiro: "Relações de Produção e Emprego na Agricultura do Nordeste", Discussion Paper No. 98, Department of Economics, Federal University of Pernambuco (1980) and "Capitalismo e Pequena Produção na Agricultura no Nordeste", Master's Thesis, State University of Campinas (1978).

2/ In Pernambuco, for example, the indices of farm-gate prices for corn and cotton (deflated by the FGV index 2) have risen from 100 in 1970 to 114 and 173, respectively, in 1979. The analogous index for beef cattle prices, in contrast, stood at 190 in 1979. Similar relative price trends may be observed in the other northeastern states.

3/ An alternative to expelling sharecroppers is to have sharecroppers clear and plant an area one year and leave it in pasture a year later. In this way, the sharecropper does not remain on the same land for more than a year, thereby avoiding the possibility of his claiming rights to the property by virtue of his permanence on a plot of land. The sharecropper is usually willing to move on to new or recently fallowed land, which will produce a decent crop without purchased inputs like fertilizer.

2.33 A similar phenomenon has been occurring in the sugarcane areas of the zona da mata. There the work force, which in the past was largely comprised of stable tenants (moradores) who exchanged labor in the cane fields for the right to cultivate a small subsistence plot, has become increasingly dominated by itinerant wage laborers (known as "boias frias" or "clandestinos") living in urban areas. The factors behind this transformation are varied, but some authors attach great importance to the 1963 Rural Labor Statute, which, for the first time, obliged landowners to pay their permanent employees a minimum cash wage and provide annual vacations and other benefits already enjoyed by urban workers. Another factor cited in the literature is the rapid expansion of sugar production (see Table 2.7), which has increased the need for land formerly devoted by moradores to subsistence food crops.

2.34 Land distribution. The difficulties of obtaining secure land tenure are greatly exacerbated by the highly skewed distribution of farmland in the Northeast. As shown in Table 2.9, the region's rural economy is characterized by the so-called "minifundio-latifundio complex" where many small subsistence farms coexist with a few large farms largely devoted to plantation agriculture or extensive cattle-raising. In more specific terms, farms under 10 hectares account for 70% of total establishments, but only 5.5% of the land area. In contrast, farms larger than 1,000 hectares comprise less than 1% of total establishments, but nearly 30% of the area under farms. An additional, and particularly striking, comparison is that the 224 largest farms in the Northeast (each exceeding 10,000 hectares) control more land in absolute terms than the 1.7 million smallest (each less than 10 hectares).

2.35 There is some indication that the distribution of land has worsened over the past two decades. While the number of small farms (under 10 hectares) about doubled between 1960 and 1975, the total land area in this category rose by only slightly more than 50%. As a consequence, the average farm size fell from 3.2 to 2.6 hectares. Farms in the large category (over 1,000 hectares) also fell in average size over the period, but to a much lesser extent in relative terms, i.e., from 2,693 to 2,524 hectares. Gini coefficients of land distribution in the Northeast calculated for 1960, 1970 and 1975 are .841, .851 and .859, respectively, further attesting to the very high and rising concentration of farm land. 1/

2.36 Aside from the obvious implications for income distribution, concentration of land ownership implies some important trade-offs with regard to output and employment. As shown in Table 2.10, the intensity of both land and labor use declines rapidly as farm size rises. About 26 million hectares (excluding fallow land) were idle in 1975. Of this total, approximately 11.5 million hectares were accounted for by farms larger than 1,000 hectares. This idle land was equivalent to almost three times the total land area held by farms under 10 hectares.

1/ The Gini coefficients for Brazil as a whole are: .837 (1960), .838 (1970) and .850 (1975).

TABLE 2.9

NORTHEAST REGION: SIZE DISTRIBUTION OF FARM ESTABLISHMENTS, 1975

Area Interval (ha)	No. ('000s)	%	Area ('000s ha)	%
Less than 10	1,641.9	69.9	4,311.5	5.5
10- 100	567.0	24.1	18,185.6	23.1
100- 1,000	131.1	5.6	33,222.8	42.2
1,000-10,000	8.9	0.4	18,257.5	23.2
Over 10,000	0.2	0.0	4,711.6	6.0
Total	2,349.1	100.0	78,690.5	100.0

Source: IBGE, Censo Agropecuário, 1975.

TABLE 2.10

NORTHEAST REGION: INDICATORS OF FACTOR INTENSITY BY FARM SIZE, 1975

Area Interval (ha)	Gross Output (1975 Cr.$ /ha) (a)	(b)	Employment (workers/100 ha.) (a)	(b)	Mechanization (tractors/1,000 ha.) (a)	(b)	Idle Land * (% total area)
Less than 10	1,498.7	1,592.8	132.4	198.1	0.1	0.2	12.7
10- 100	384.7	1,143.2	14.0	62.4	0.1	0.6	36.2
100- 1,000	207.1	1,509.8	2.8	30.8	0.2	2.5	42.9
1,000-10,000	97.0	1,034.0	0.8	13.7	0.2	3.4	46.8
Over 10,000	19.2	322.1	0.2	4.4	0.1	3.5	61.7

* Includes land in natural state and idle land otherwise suitable for crops, pasture formation or reforestation.

Note: (a) = total farm area; (b) = farm land under crops.

Source: IBGE, Censo Agropecuário, 1975.

2.37 The reasons why such large amounts of land are left idle on larger farms are not entirely clear. One hypothesis is that many large landholders are not profit maximizers but view land mainly as a source of prestige or political power. An alternative hypothesis is that such landholders prefer to hold land for speculative purposes or as the basis for obtaining heavily subsidized credit, rather than using it for production. 1/ Finally, it is possible that idle land is simply of inferior quality and not profitable to cultivate. 2/ All three hypotheses are probably valid to some extent, but this is an area where further research is needed.

2.38 The data show that labor use per hectare is over 600 times higher on farms in the smallest size category than the largest. This wide difference is largely explained by the greater relative importance of cattle-raising and the high proportion of idle land on large farms. However, even if only land devoted to crops is considered, the labor intensity on farms smaller than 10 hectares is still 45 times higher than on farms larger than 10,000 hectares. The relatively low use of labor on larger farms is to some extent compensated for by mechanization, but the gross value of crops per hectare in use on the largest farms is only about 20% of that achieved on the smallest farms.

1/ In the eight northeastern states for which complete data are available (i.e., excluding Piauí) average prices of crop land increased at a much greater rate than the general price index over the 1970-79 period. Moreover, sales prices increased by more than rental payments. This latter relationship suggests that nonproduction-related benefits associated with land ownership have grown more rapidly than income from production. See below:

Indexes of Sales Prices and Rents for Crop Land, 1979 *
(1970 = 100)

	Sales Prices	Rents
Maranhão	314	177
Ceará	231	140
Rio Grande do Norte	215	173
Paraíba	287	262
Pernambuco	369	199
Alagoas	592	327
Sergipe	478	230
Bahia	328	221

* Deflated by FGV Index 2

Source: Getulio Vargas Foundation

2/ However, Kutcher and Scandizzo concluded that, with the exception of southern coastal Bahia, no significant statistical relationship existed between land quality and farm size.

2.39 A redistribution of land would almost certainly increase employment, especially of family workers. There would also be output gains to the extent that land now idle and suitable for farming would be put to use. Tenants who have had to work new plots of land each year would be able to devote the time now spent on clearing and fencing land to cultivation. However, the small farmer may well need technical assistance and expanded access to credit and markets in order to achieve substantial increases in output. In addition, larger farm sizes than the average 2.6 hectare holdings may be required for some crops and soils. Though gross output per hectare is highest on farms of less than 10 hectares, the small average farm size in this category (i.e., 2.6 hectares) suggests that many smallholders are very poor. 1/

2.40 Progress Toward Rationalization of Land Use. Although land tenure problems and the comparative inefficiency of large farms have been acknowledged for many years, Government policy to date has had a negligible impact on the Northeast land tenure situation. Lack of enforcement of the comprehensive Brazilian land law (Estatuto da Terra) 2/ and the lack of a specialized judicial system for land matters have impeded progress toward improving land tenure security for small farmers. Neither large-scale colonization efforts nor rural poverty programs, such as POLONORDESTE, have succeeded in reaching a substantial number of landless farmers.

2.41 Recently, there has been an increasing amount of activity on land tenure issues. Land institutes have now been created in several Northeast states, including Bahia, Ceará, Maranhão, Piauí, and most recently, Paraíba. In addition, INCRA (National Institute of Colonization and Agrarian Reform), the federal agency most directly involved in land matters, has begun to play a more active role in the Northeast. In December 1979, a progressive federal land tax which superseded an earlier tax, was approved by Congress. Under the law, tax rates increase with property size and degree of non-utilization or inefficient use. 3/ As a first step toward universal enforcement of the law, INCRA has executed land discrimination campaigns in several areas of the Northeast. 4/ A land discrimination and titling project for five Northeastern

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1/ In 1975 prices, for example, average gross farm incomes of such producers would be in the neighborhood of US$95 per capita. This estimate is based on gross output per hectare for small farmers (from Table 2.10), the average size of small farm (2.6 ha), and average family size (5).

2/ The Estatuto da Terra, passed in 1964, allows the Government to acquire land through several means, ranging from purchases to expropriations, and distribute (or redistribute) the acquired properties to small rural (including landless) producers.

3/ For details, see "A Review of Agricultural Policies in Brazil," Report No. 3305-BR, September 11, 1981.

4/ Discrimination involves separation of public lands from lands legally transferred at some stage to private parties.

states, with IDB financing, has recently been approved. INCRA has also declared parts of the Northeast as "priority areas for agrarian reform," laying the legal groundwork for possible expropriation by the federal government (see para. 3.39, 3.44-3.45).

2.42 Nonetheless, progress is slow. Expropriation is still exceptional, requiring presidential approval. In general, legal statutes are not enforced, and establishing tenure rights is often complicated and can involve cumbersome legal procedures. The state land institutes still need to build up their capability to carry out their responsibilities. It is also too early to tell whether the land tax will be administered seriously and have a noticeable impact on land use.

CHAPTER III

FEDERAL INVOLVEMENT IN THE NORTHEAST

3.01 The current federal programs directed toward the rural sector build on over 90 years of direct involvement in the Northeast. The federal government has invested considerable resources and has tried many different strategies to stimulate rural development and to address the natural resource and land tenure constraints. In spite of the attempts, little progress has been made toward land redistribution and making the region more drought-resistant. Poverty remains a serious problem, and agricultural productivity in the region continues to lag behind productivity in the Central-South.

3.02 This chapter begins with an estimate of the federal resources currently being channeled to the rural Northeast through: POLONORDESTE, an integrated rural development program; Sertanejo project, which focuses on improving the productivity and drought-resistance of the rural sertão; large irrigation programs, run by DNOCS, the principal anti-drought agency, and by CODEVASF, which is responsible for development of the Sao Francisco river valley; Water Resource Use program (PROHIDRO), directed to the semi-arid part of the region; Emergency Drought Relief; PROCANOR , to assist the poor in the sugar-growing areas; and the Agro-Industry Credit program.

3.03 The rest of the chapter traces the historical evolution of Northeast development policies, highlighting the rationale, accomplishments, and shortcomings of earlier approaches and the amount of resources devoted to them. The historical record shows a shift in strategies from drought-related interventions toward multi-pronged regional development, as the socio-economic origins of poverty have become widely acknowledged. The Government has not only tried to increase agricultural productivity in drought-prone areas; it has also attempted to draw the landless and poor to more fertile areas outside the drought area, and, by emphasizing industrialization, has indirectly stimulated migration to cities within the region. The regional history of the last 20 years is in many respects SUDENE's history; the creation of SUDENE and the evolution of its objectives and role in regional development are described.

3.04 The more recent programs are somewhat different from earlier ones. During the decade of the 1970s, public policy initiatives shifted from the regional development agencies to the federal government. Rural development, neglected in previous years, has become more important, and more attention is now being focused on raising the living standards of small and medium producers, rather than simply increasing the productivity of agriculture (crops) per se. The intensive and coordinated assistance to a limited number of priority areas found in the POLONORDESTE, Sertanejo and PROCANOR programs (the growth pole concept) is a significant departure from earlier approaches. So is the choice of areas with agricultural potential, as in POLONORDESTE, and the targetting of assistance to small landowners, rather than the landless, as in Sertanejo.

A. Resources for Special Programs

3.05 The public expenditures budgeted for the special programs in the rural Northeast amounted to Cr$15.9 billion (US$301 million) in 1980. 1/ Of the special programs, POLONORDESTE receives almost 50 percent of these allocations. The emergency drought relief program, which is not a special program, has also added a substantial amount of resources to the region. In 1980, budgeted expenditures for emergency relief reached Cr$14.7 billion (US$278 million), an amount almost equalling the total spent on the special programs.

3.06 The federal government has expressed a strong commitment to the region, although budgeted resources have fluctuated from year to year. As shown in Table 3.1, there was a rapid growth of spending from 1975 to 1978, followed by real declines (with the exception of Sertanejo) in 1979 and 1980. However, the most likely cause of this phenomenon was the decline in the real volume of PIN and PROTERRA resources (the major sources of funding for the special programs) since 1978 and not a change in government priorities. 2/ Although all regional special programs were affected by the reduction in PIN-PROTERRA funds, the share of the Northeast in all regional special programs rose from 58.5% to 61.1% between 1978 and 1980. Moreover, during his visit to the Northeast in April 1981, as the region was entering its third year of drought, President Figueiredo pledged supplemental federal funding for the region totalling Cr$100 billion (equivalent to US$1.1 billion at the time). Of this sum, about Cr$36 billion was to be allocated to the special programs.

3.07 The special programs are not the only means through which the federal government assists the rural Northeast. Ongoing national policies with respect to crop support prices, rural credit, fuel alcohol production from sugar and manioc, cocoa development and so forth all have important implications for the Northeast. So, too, have the resources channeled through the federal revenue-sharing schemes (which tend to favor the Northeast), the "34/18" mechanism and the "normal" spending operations of federal line agencies. Though difficult to quantify, the combined financial impact of these interventions undoubtedly dwarfs that of the special programs.

3.08 Though the special programs have helped direct federal funds to rural development, the absence of a regionalized federal budget for recent years makes it impossible to determine whether these funds have constituted net additions to "normal" expenditures in the region. However, in 1975, the most recent year for which a regionalized budget is available, per capita direct federal expenditures (including inter-governmental transfers but excluding taxes foregone through fiscal incentives) in the Northeast were only 36% of

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1/ At present, no reliable and comprehensive information are available on the amounts actually spent in any given year.

2/ The availability of PIN-PROTERRA resources (discussed in para. 3.34-3.39) has been reduced by changes in the legislation governing corporate income taxation and, more recently, by the general slowdown of industrial activity.

Table 3.1

PUBLIC EXPENDITURES BUDGETED FOR SPECIAL PROGRAMS IN THE RURAL NORTHEAST
(Cr.$ Billions in 1980 Prices)

Fiscal Year	Total	POLONORDESTE*	Irrigation	Sertanejo	Agro- ** Industry	PROCANOR	PROHIDRO
1975/76	7.4	3.1	3.0	-	1.3	-	-
1976/77	15.5	6.8	7.2	-	1.5	-	-
1977/78	16.1	7.3	6.5	1.1	1.2	-	-
1978/79	18.9	8.8	8.2	1.5	0.4	-	-
1979/80	16.4	8.1	5.4	1.5	0.6	-	0.8
1980/81	15.9	7.1	3.5	1.5	0.3	0.5	3.0

* Includes foreign borrowing.

** Not considered in this report.

Source: IPEA/IPLAN

the national average. 1/ Closing this "gap" would have required additional expenditures of Cr$54 billion, or about US$7 billion, in 1975 prices. Inflated to 1980 cruzeiros, this sum is equal to 30 times the total amount budgeted for Northeast special programs in 1980. 2/

3.09 Combined direct federal expenditures in the Northeast rose about 85% in real terms between 1970 and 1975, although the region's share of the federal budget (including the decentralized agencies) fell from 11% to 9% during the same period. 3/ It is difficult to ascertain whether or not the flow of federal resources to the Northeast represents a net inflow or outflow of resources via the federal budget (the balance between federal taxes collected and expenditures in the region). In 1975, the region enjoyed a nominal net inflow on the order of of Cr$10 billion in current prices, an amount equal to half the total federal taxes collected in the region. However, given the Northeast's chronic deficit in interregional trade, it is likely that calculations of the effective regional tax burden, taking into account probable interregional shifting of indirect federal taxes such as the manufacturers sales tax (IPI), would show a much smaller net inflow and possibly a net outflow. Unfortunately, the data necessary for making such adjustments are not available. But even if such data were available, the question of whether or not the Northeast receives a "fair share" of federal expenditures by necessity involves a normative judgment concerning the proper balance between efficiency and equity considerations.

B. Review of Public Policies for the Rural Northeast

3.10 The current programs for the rural Northeast attempt to address problems which have existed for many years. The historical record shows clearly the persistence of poverty, inefficient land use, and water shortages. It also highlights the difficulty of translating a general concern for the region into a consistent, long-term plan of action with specific objectives.

Drought-Related Interventions

3.11 The drought of 1877-79, which drew the official attention of the federal government to the Northeast for the first time, constituted a disaster of unprecedented proportions for the region. The economy of the sertão had already been weakened by the end of a 30-year cotton boom and, when combined

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1/ See Fundação Getulio Vargas/Centro de Estudos Fiscais, Regionalização das Transações do Setor Público, 1975 (Rio de Janeiro, 1980).

2/ This comparison is given for purely illustrative purposes. Of course, to measure the extent to which the special programs filled the expenditure "gap" in 1980, one would need to know the level of "normal" expenditures in that year.

3/ Fundação Getulio Vargas, Instituto Brasileiro de Economia, Regionalização das Transações do Setor Público, 1970, volume II (Rio de Janeiro, 1978); and 1975 (Rio de Janeiro, 1980).

with crop failures, most landowners could not continue to support their workers. The result was mass emigration to the cities or to Amazonia and, ultimately, violence, starvation and death. The national publicity given to this tragic situation resulted in the establishment of an Imperial Commission of Inquiry (1877). Charged with recommending ways to avoid such disasters in the future, the Imperial Commission called for improvements in the region's harbors and railroad network as well as the construction of some 20 dams. The problems encountered with the Quixada Dam, the largest of the dams, made clear the need for a unified and permanent agency to elaborate and coordinate drought-related public works. Such an agency, the Inspectoria de Obras Contra as Secas (IOCS), linked to the Ministry of Public Works, was finally established in 1909.

3.12 The actions of the IOCS and its successors 1/ were predicated on the belief that "the" problem of the Northeast was the drought, and that this problem could be solved through engineering. Central to this approach was the construction of storage reservoirs, or açudes, to provide water sources during droughts and, through irrigation, to allow agriculture during the annual dry season. Other measures included the drilling of wells, the improvement of transportation networks to provide work for the unemployed in drought years, and the installation of hydroelectric works. 2/

3.13 The performances of the anti-drought agencies during their first half century of existence were erratic, as the flow of funds tended to be closely related to the severity of a given drought and the geographical origins of the incumbent national president and/or important ministers. 3/ Operations were also marred at times by poor administration and technical problems such as the salinization of açudes and irrigation canals. Nonetheless, by 1959, the accumulated accomplishments of these agencies were impressive, at least on paper. Over 600 açudes, with a combined storage capacity of some 8 billion cubic meters, had been completed, and an additional 200 were under construction. Additional accomplishments included the drilling of some 5,000 wells and the construction of 12,000 kilometers of roads.

3.14 Despite the efforts described above, it became increasingly apparent in the 1940s and 1950s that the engineering approach of the anti-drought agencies had done relatively little to advance the economic development of the Northeast. First of all, the direct benefits of the public works had

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1/ The IOCS was renamed the Inspectoria Federal de Obras Contra as Secas (IFOCS) in 1918 and Departamento Nacional de Obras Contra as Secas (DNOCS) in 1945. The latter, linked to the Ministry of Interior, remains as the principal anti-drought agency.

2/ An underlying motive for providing a temporary means of subsistence was to retain small farmers and landless workers in the semi-arid region in order to maintain a labor force.

3/ In order to help stabilize funding for the anti-drought programs, the Constitution of 1934 called for earmarking 4% of federal tax revenues to IFOCS projects located in the "Drought Polygon". This provision, however, was omitted from the Constitution of 1937.

accrued primarily to a very small segment of the rural population. In particular, irrigation projects primarily benefited large landowners because of the skewed distribution of land although they also stabilized employment. 1/ Secondly, the public works had not succeeded in limiting the negative effects of the drought to any appreciable degree. This aspect was highlighted in 1958, when a particularly severe drought hit the Northeast, resulting once again in mass emigration and the establishment of work fronts to employ some 536,000 refugees, or 13% of the region's population. The 1958 drought, like that of 1877-79, was a turning point for development policy for the Northeast, and in the ensuing years there was a growing recognition of the socioeconomic origins of regional poverty.

Crop-Specific Policies

3.15 While early official policies for the Northeast were mainly directed towards the semi-arid sertão, some interventions were undertaken to support the major export commodities of the humid zona da mata -- namely, sugar and cocoa. With respect to sugar, policies prior to 1930 were essentially ad hoc, responding to periodic downturns in the international market for this commodity and consequent pressures from cane planters and refiners. Typical government actions of this period were tariff adjustments and the provision of production credit.

3.16 With the collapse of the world sugar market in 1929-30, a specific agency, the Instituto do Açucar e do Alcool (IAA), was created to deal in a systematic and permanent manner with the problems of the sugar industry. The major functions of this agency, which still plays a dominant role in the sugar economy, were to fix production quotas, provide production credit, establish norms for the operation of new sugar mills and to stimulate the modernization of equipment. Owing to the crop-specific nature of the IAA, it never in its early years concerned itself with overall regional or sub-regional development, nor did it intervene directly to improve the socioeconomic conditions of the sugar workers.

3.17 It was not until 1957 that a federal agency, the Comissao Executiva do Plano de Recuperação da Lavoura Cacaueira (CEPLAC), was established to deal with the problems of the cocoa industry. During its first few years of existence, however, CEPLAC functioned mainly as a credit agency and did little to plan for the long-term development of the cocoa-growing areas. Moreover, like the IAA, it operated in virtual isolation and was not a part of any master plan or strategy for the development of the Northeast.

The Origins of Regional Planning

3.18 Although the first attempts at comprehensive regional planning did not materialize until the early 1960s, a movement away from the overriding concerns with the drought and the regional sugar economy may be noted in the late 1940s and 1950s. During this period, government policies began to

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1/ Although several irrigation and agrarian reform bills were introduced in Congress during the 1940s and 50s, little was done to combine açude construction with the expropriation of irrigable lands.

focus on the middle and lower sections of the São Francisco Valley. Here the task of development was much different than in Ceará, Rio Grande de Norte and Paraíba, where the anti-drought agencies had traditionally concentrated their efforts. While in these states alleviating the effects of droughts was viewed as a well-defined task, the physical and demographic characteristics of the São Francisco Valley (e.g., the availability of a perennial water source in the São Francisco river; poor soils; low, but fairly regular, rainfall; and a very sparse population) suggested the need for a multi-sectoral approach to development.

3.19 The initial steps to implement this multi-sectoral approach were the establishment in 1945 and 1948, respectively, of the Companhia Hidro-Elétrica do São Francisco (CHESF) and the Comissão do Vale do São Francisco (CVSF). 1/ The initial objective of the former agency was rather straightforward, i.e., the development of the hydroelectric potential of the Paulo Afonso falls on the São Francisco river. In contrast, CVSF, modelled after the Tennessee Valley Authority, was to promote the settlement and development of the entire 630,000 km^2 river basin. Among the specific functions of CVSF were: river flow regulation, flood control, land use planning, irrigation, production of hydroelectric energy, improvement of river and road transportation and communications, and the provision of various social services.

3.20 Of the two agencies operating in the São Francisco Valley, CHESF is generally considered to have been the most successful. The first stage of the Paulo Afonso project was completed in 1955, and the resulting increase in electric power provided a strong basis for new regional industry and other forms of economic activity. 2/ Owing mainly to the enormity and diversity of its aims, the performance of the CVSF was disappointing. Budgetary funds were spread thin in an attempt to satisfy local political interests, and little concrete was accomplished other than the construction of some feeder roads and small hospitals and the provision of water and electric power to towns in the Valley. 3/

3.21 Another important institutional development of this era was the creation of the Bank of the Northeast (Banco do Nordeste or BNB) in 1952. To a certain extent, the BNB was a response to the 1951 drought. One of its stated objectives was to extend credit to the producers of drought-resistant crops such as moço cotton, carnauba palm, oiticica nuts and sisal. An additional justification for the Bank was the imminent completion of the Paulo Afonso project and the view that credit would be needed to finance

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1/ CVSF was renamed Superintendência do Vale do São Francisco (SUVALE) in 1967 and Companhia do Desenvolvimento do Vale do São Francisco (CODEVASF) in 1974.

1/ In 1950, the World Bank helped finance this project through a US$15 million loan (Loan No. 25-BR) for a 120,000 KW generating plant and associated transmission lines.

2/ It should be pointed out that budgetary earmarking for the Northeast was reinstated in the Constitution of 1946. Of a total of 4% of federal tax revenues, DNOCS and CVSF were to receive 2% and 1%, respectively. The remaining 1% was to constitute a special emergency fund for drought relief.

the expected new industrial development. Despite the original intention to turn the BNB into a regional development and investment institution, throughout the 1950s most of its operations were of a short-term commercial nature. This phenomenon was closely related to the difficulties of identifying appropriate industrial investment opportunities and the operational problems encountered when seeking to extend agricultural credit to small farmers.

The Creation of SUDENE

3.22 With the proliferation of agencies directed to Northeast development, the federal government felt the need for greater coordination of its activities in this region. To this end, a Working Group for Northeast Development (Grupo de Trabalho para o Desenvolvimento do Nordeste or GTDN) submitted a report, officially entitled "A Policy for the Economic Development of the Northeast", to President Kubitschek in early 1959. It was prepared under the intellectual leadership of Celso Furtado, at that time a young northeasterner serving as a director of the National Bank for Economic Development (BNDE).

3.23 The Furtado Report. The GTDN document, commonly known as the "Furtado Report", was one of the most incisive reports ever written on the problems and prospects of the Northeast. It called attention to the wide socioeconomic disparities between the Northeast and the Center-South and the widening of this gap in preceding years. The report acknowledged the importance of natural and structural factors as causes of the Northeast's relative backwardness, e.g., the scarcity of arable lands, inadequate rainfall and the the predominance of subsistence agriculture in the sertão. But it also argued that postwar economic policies, by subsidizing industry and discriminating against primary exports, had favored the Center-South to the detriment of the Northeast.

3.24 The significance to the regional economy of primary exports and federal government expenditures was also stressed in the Furtado Report. In this regard, it was held that traditional exports like sugar and cotton, because of periodic variations in world market conditions, exerted a destabilizing influence, and that the productive structure of the Northeast should therefore be diversified. Public expenditures were considered necessary to offset the net outflows of private capital to the Center-South. However, it was pointed out that much of this federal spending had in the past consisted of emergency transfers which had done little to create permanent new economic activity and employment.

3.25 The report also highlighted the special vulnerability to droughts of the weaker elements of rural society, especially subsistence producers in the sertão. This emphasis on the socioeconomic, as opposed to purely climatic aspects of the drought, indicated an important divergence from the traditional concerns of the anti-drought agencies. In fact, the drought-related programs themselves were sharply criticized. The short-term emergency programs were considered merely a way of stimulating a demand for foodstuffs which, because of the crop failures associated with droughts, could only be satisfied by imports from other regions. The longer-term measures, mainly açude construction, were criticized on the grounds that they benefited relatively few

and did not address the basic socioeconomic origins of poverty in the rural Northeast. Finally, it was argued that both the long and short-term anti-drought measures had acted to retain a larger population than the sertão was capable of supporting.

3.26 On the basis of its diagnosis of the northeastern economy, the Furtado Report proposed a development strategy having four basic objectives. These were: (i) intensification of industrial investments, with the aim of creating an autonomous manufacturing center in the Northeast; (ii) diversification of agriculture in the humid coastal zones to generate adequate food supplies for urban centers selected for industrialization; (iii) progressive improvement of the productivity and drought-resistance of sertão agriculture; and (iv) directed colonization in Maranhão to absorb excess population. These lines of action were considered by many to be radical. However, they were put forward at an opportune time. The disastrous impact of the 1958 drought had vividly shown the shortcomings of the engineering approach to development at a moment when regional politicians were strongly reacting against the heavy concentration of government investments in the more advanced South. The report sidestepped the sensitive issue of land reform by linking the expansion of food production in the zona da mata to expected productivity gains in the sugar economy and through proposed colonization projects in Maranhão to absorb excess population.

3.27 Policy Coordination. Once the Furtado Report had outlined an action plan for Northeast development, the need for a regional agency to coordinate policies became even clearer. In response to this need, a Superintendency for the Development of the Northeast (SUDENE), directly linked to the Office of the President, was established in 1959. Furtado served as its first superintendent, a position which enjoyed ministerial status until 1965. 1/ Headquartered in Recife, this new federal agency was to be managed by a board of directors composed of representatives of the various line ministries; agencies such as DNOCS, CHESF, CVSF, BNDE and BNB; and the governors of the nine northeastern states.

3.28 The formal powers given to SUDENE were wide-ranging and included control over all on-going activities and investments in the region plus responsibility for drought emergency measures. In addition, the agency came to administer a powerful array of fiscal and credit incentives for the purpose of attracting new private investment to the region. The most important of the fiscal incentives was the "34/18" fund. 2/ In general terms, it is a mechanism through which corporations may reduce their income tax liabilities by up to 50%, if the resulting savings are invested in projects located in the Northeast and approved by SUDENE.

1/ In 1965, SUDENE became subordinated to the Special Ministry for the Coordination of Regional Agencies and later (1967) to the Ministry of the Interior.

2/ It is now called FINOR (Fundo de Investimentos do Nordeste).

C. SUDENE's First Ten Years

3.29 In principle, the establishment of SUDENE opened the way for a comprehensive program of development for the Northeast. The new regional development agency seemingly possessed sweeping powers of control plus adequate funding in the form of a 2% earmarked share of federal tax revenues. In practice, however, SUDENE's role was highly circumscribed.

3.30 First of all, it could only exercise control over public investments contemplated in the multi-year regional development plans (Planos Diretores). Since SUDENE could not force other agencies to participate in these plans, much depended on inter-agency goodwill -- a factor not always present during the 1960s. Between 1961 and 1970, for example, only about half of funds proposed in the Planos Diretores were actually appropriated. Secondly, despite the earmarking provision mentioned above, the resources available to SUDENE were considered annually by Congress and were thus subject to cuts and delays. Finally, the participation of the state governors on SUDENE's board of directors added a conservative element to policy decisions which impeded progress in achieving the principal changes called for in the Furtado Report.

Industrialization

3.31 Although the agricultural sector was not completely neglected during the 1960s, the overwhelming priority of SUDENE was industrialization. In quantitative terms at least, this policy appeared successful. Between 1962 and 1970, SUDENE approved 581 industrial projects (448 being new to the region) under the 34/18 program. This amounted to a total projected investment of US$1.4 billion (1961 prices) and the direct creation of some 75,000 jobs.

3.32 By the end of the decade, however, the industrialization policy of SUDENE became increasingly criticized on both technical and political grounds. In the first sense, many questioned the unintentional promotion of a capital-intensive industrial structure in a region characterized by chronic unemployment and underemployment. The lack of significant linkages between the new industry and the agricultural sector was also pointed out. Politically, the industrialization policy was criticized because of the high concentration of investment in the metropolitan areas of Recife and Salvador resulting in increased intraregional growth disparities.

Agricultural Development

3.33 Though the formal policies of SUDENE, as stated in the four Planos Diretores of the 1960s, closely followed the recommendations of the Furtado Report, little concrete was accomplished. In the area of water resource development, for example, government actions were mainly confined to surveys and a few pilot projects to determine the viability of irrigation in selected river basins. A comprehensive study of the irrigation potential of the Northeast, carried out by the Grupo Executivo de Irrigação para o Desenvolvimento Agrícola (GEIDA) in collaboration with an Israeli consulting firm, was finally initiated in 1968, but a multi-year irrigation plan was not published until 1971. The politically sensitive issue of increasing food production in the

sugar-growing areas was likewise relegated to a study group (Grupo Especial para a Racionalização da Agroindústria Canavieira do Nordeste or GERAN) established in 1966. 1/

3.34 SUDENE's early experience with directed settlement also fell far short of expectations. The original plan was to settle 25,000 families over a five-year period on 1.5 million hectares of land donated to SUDENE by the state of Maranhão. Fifty-hectare plots were subsequently demarcated, and a system of rural credit and technical assistance was installed, but SUDENE never exhibited the financial or managerial resources necessary to make the project a success. By 1972, after almost ten years of operation, the Alto Turi project as it was called, had only settled 844 families. 2/

3.35 As in the industrial sector, the most powerful instruments for promoting agricultural development were the fiscal and credit incentives at SUDENE's disposal. Between 1965 and 1970, 286 agricultural and livestock projects (mainly the latter) were approved for such incentives. However, SUDENE's selection procedures, which required detailed project proposals and substantial financial contributions on the part of the private investors, all but ruled out the participation of small and medium-sized producers. This is evident from the data which show the average project size to have been around 4,000 hectares.

D. The Drought of 1970 and the Establishment of PIN and PROTERRA

3.36 As the 1960s ended, only part of the development strategy proposed in the Furtado Report had been implemented, and it was difficult to perceive any real changes in the countryside. This latter point was brought home once again by another severe drought, which hit the region in 1970. SUDENE, whose prestige had fallen progressively over the 1960s, in large degree as a result of the rapidly increasing centralization in Brasilia of decision making over regional policy, was attacked vigorously for the vacillation it demonstrated in starting up work fronts and distributing emergency work relief. As reports of widespread looting reached the national press, President Medici decided to visit the Northeast to undertake a personal assessment of the situation. The result of this visit was the immediate release of federal relief funds and a major reformulation of regional development policy.

1/ An ingenious plan combining measures to intensify sugar production with land redistribution to small producers was proposed by SUDENE in 1962 but never executed. See: Manuel Correia de Andrade, The Land and People of Northeast Brazil (Albuquerque, N.M., 1979), pp. 193-94.

2/ In this same year SUDENE reduced the scale of the project and created a subsidiary (Companhia do Colonização do Nordeste or COLONE) to handle its administration. In its modified form, the Alto Turi project has been moderately successful. The World Bank helped finance the reformulated project through a US$6.7 loan (Loan No. 853-BR of July 24, 1972).

National Integration Program

3.37 The centerpiece of this new policy was the National Integration Program (PIN), established in 1970 just a short time after the President's return from the Northeast. This program, to be financed through a 30% share of the "34/18" funds, had among its objectives: (i) the opening of the Amazon region via new highway construction and the subsequent settlement of 70,000 families; (ii) the financing of a plan to irrigate 40,000 hectares in the Northeast during 1972-74; and (iii) the creation of export corridors in the Northeast. The major innovations of PIN were to link the development of the Northeast to that of Amazonia and to associate irrigation with anti-drought measures and overall regional development. It also signified a clear transfer of the power of policy formulation from the regional development agencies to the central government.

3.38 Although the decision to establish PIN was generally well received, it was not without its share of critics. Perhaps the most vocal of the early criticism emanated from northeastern political interests, which viewed PIN as a means of transferring "34/18" funds from their region to Amazonia. This policy, they argued, would severely limit the action of SUDENE and, hence, slow the process of regional industrialization. Also questioned was the logic of physically linking the Northeast and Amazonia, when areas suitable for agricultural colonization were more readily accessible in Maranhão.

Land Redistribution and Agroindustrial Modernization Program

3.39 Complementing PIN was the Land Redistribution and Agroindustrial Modernization Program (PROTERRA) established in 1971. The official objectives of this program were to facilitate land acquisition, improve rural labor conditions and promote agroindustry in the Northeast and Amazonia. It was to be funded through federal budget allocations, transfers from PIN and a 20% share of the "34/18" funds. Specific actions to be financed through PROTERRA included: the purchase or expropriation of large landholdings for subsequent resale to small and medium producers, rural credit and the modernization of agroindustry and its supporting infrastructure.

3.40 The creation of PROTERRA, like that of PIN, was an attempt to reorient the previous strategy of regional development based on industrialization. In his formal announcement of PROTERRA, President Medici directly criticized the fiscal incentive system and its excessive concentration in the industrial sector. The benefits of this system, he argued, had been almost entirely confined to urban areas, thus neglecting over half the population of the Northeast and Amazonia. PROTERRA would rectify this problem by attacking two of the major causes of rural poverty in these regions: the unequal distribution of land ownership and the inefficient utilization of the land itself. As before, the possibility of linking rural development more closely with industrial growth was never considered.

3.41 As might be expected, PROTERRA was also criticized by northeastern interests, who feared the consequences of a further reduction of "34/18" funds at the disposal of SUDENE. The official response to this criticism was that total fiscal incentive funds destined for the Northeast would not fall as a result of PROTERRA, but would only be directed more toward the agricultural sector. However, since this program was to be administered by the Ministry of Agriculture, through the Instituto Nacional de Colonização e Reforma Agrária (INCRA), the role of SUDENE in the execution of regional policy was effectively lessened.

Experience to the Mid-1970s 1/

3.42 The Northeast-Amazonia nexus. The First National Development Plan (1972-74) continued to stress the perceived socioeconomic complementarities between the Northeast and Amazonia implicit in the objectives of PIN. At the time, the logic of this argument had certain attractions: through a major program of highway construction in the sparsely populated North, immediate employment could be created for nordestinos thrown out of work by the drought, and, in the longer-term, directed settlement along the highways could reduce population pressures and social tensions in the Northeast, while furthering the essentially geopolitical goal of occupying and developing Amazonia. The first concrete result of this grand strategy was the completion of the initial 1,200 kilometers of the Trans-Amazon highway in 1972. 2/ INCRA was to establish a network of planned communities along this part of the highway and to recruit prospective colonists, mainly from the Northeast.

3.43 The results of this strategy fell well below initial expectations. Although available data sources are not completely consistent, it appears that only slightly more than 6,000 families were actually settled along the Trans-Amazon highway by the end of 1974. This total represented only about 8% of the official target and less than 2% of the "excess" rural population of the Northeast estimated for 1970. The explanations of this shortfall are both varied and complex. The core of the problem, however, seems to lie in the naive premise that northeastern migrants could be readily transformed into prosperous farmers in a region where most soils are unsuitable for traditional agriculture. Compounding this fundamental misconception were a series of technical and administrative errors on the part of INCRA.

3.44 Land redistribution vs. agroindustrial modernization. While in the 1960s some progress had been achieved (mainly through fiscal incentives) in modernizing the region's agroindustrial sector, virtually nothing had been accomplished with respect to improving access to land. Thus, in the latter area, PROTERRA was initially hailed as a bold attempt to implement finally the radical transformations in the Northeast's agrarian structure proposed in the Furtado Report. Since the aim of this policy was to bring about changes in land tenure with a minimum of social disturbance, large landowners in selected priority zones were given six months to join the program voluntarily. By the

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1/ The experience with irrigation and drought-related measures is detailed in Chapter V.

2/ An additional 1,000 kilometer stretch was inaugurated in early 1974.

end of this period they were to identify the sections of their lands subject to expropriation and to present a list of the tenants occupying these lands. Indemnization for expropriated lands could run as high as 150% of the value declared in the INCRA cadastre.

3.45 On the basis of cadastre data, INCRA identified 854 properties larger than 1,000 hectares eligible for partial expropriation: 712 in Ceara, 129 in Pernambuco and 13 in Paraiba. 1/ However, by 1976 only 466 of these properties had been included in the program and, of the balance, just one had been involuntarily expropriated. In total, some 170,000 hectares, or less than one-fourth of the original target, were acquired through PROTERRA during the 1971-76 period. These lands were redistributed to 920 beneficiaries, each receiving, on the average, about 185 hectares. It is obvious from these figures that PROTERRA did not bring about the wide-ranging agrarian reform some had hoped for.

3.46 As the political and administrative difficulties with expropriation mounted, the orientation of PROTERRA shifted to the modernization of agro-industry. In this area, the most powerful policy instruments were special credit lines for financing such items as land acquisition, pasture formation and the production and purchase of modern agricultural inputs. These credits, mainly channelled through the Bank of Brazil, were extended at subsidized rates, ranging from 0% for purchases of soil correctives, organic fertilizers, animal feed and energy to 17% for fixed investment needs of agroindustrial enterprises. 2/

3.47 During the 1971-76 period, between 40 and 55% of all Bank of Brazil credit to agriculture in the Northeast was accounted for by PROTERRA. PECRO-I, directed to financing on-farm investment, was the most important of the credit lines, accounting for about 75% of the total credit extended through the program. In contrast, land purchase credit (PECRO-F) accounted for only about 2% of the total. Data on credit extended are not available by farm size, but, judging from the amount of the average loan contract in 1971-76 (about US$5,100 in 1976 prices), it is likely that small subsistence producers were not the main beneficiaries of the program.

New Policy Directions of the Mid-1970s

3.48 Apparently dissatisfied with the performances of PIN and PROTERRA, the Government, starting in 1974, established a number of additional special programs directed to developing the rural Northeast. Creation of these special programs was in contrast to the past when the usual response to a specific problem was the creation of a new institution. Under these special programs, the actions of public agencies were to be integrated and focused on the needs of given geographical areas, subsectors and/or "target groups".

1/ The proportion of a given landholding subject to expropriation ranged from 20% of 1,000 hectare properties to 50% of properties larger than 5,000 hectares.

2/ The national inflation rate was about 20% in 1971.

3.49 POLONORDESTE. In late 1973, the federal government constituted a Special Interministerial Commission in Brasilia, comprised of representatives of the Ministries of Planning, Interior and Agriculture, to guide the planning and implementation of a major rural development program for the Northeast. At the same time, a small regional commission was formed in SUDENE as the embryo of a technical secretariat for the future program. These initiatives stemmed from a series of events in the early 1970s, including the completion by the Ministry of the Interior of an integrated plan for limiting the effects of droughts (Plano Integrado para o Combate Preventivo aos Efeitos das Secas no Nordeste) and exchanges between the Government and various World Bank missions regarding their common interests in supporting small-farmer activities in the Northeast. The program which eventually emerged, POLONORDESTE (Programa de Desenvolvimento de Areas Integradas do Nordeste), was formalized in Decree 74,794 of October 30, 1974.

3.50 According to the Decree, the basic objective of POLONORDESTE was to "promote the development and modernization of agricultural and livestock activities in priority areas of the Northeast" through a system of growth poles. Specific measures to be simultaneously implemented in these areas included: feeder roads, rural electrification, storage, agricultural research and extension and rural credit. POLONORDESTE was to be implemented by the Ministry of the Interior (principally through SUDENE and BNB) and the Ministry of Agriculture in collaboration with the state governments and other involved ministries. Funding was to emanate from a number of sources including PIN, PROTERRA, budget allocations and foreign borrowing.

3.51 Rather than appointing its own staff to detail the objectives, strategy, methods and norms for the new program and to prepare the projects, the Government (prior to officially launching POLONORDESTE) engaged the French-Brazilian consulting firm SCET-SIRAC to undertake studies. Common geographic/ecological zones deemed to be of comparatively high agricultural potential were selected, and, within these, 24 areas were designated as development poles. The selection seemed to reflect a mixture of technical and political considerations.

3.52 Because the consultants' studies were not completed before the formal announcement of POLONORDESTE in October 1974, various state governments embarked directly on project preparation without the benefit of the advance work. In 1975, the federal and regional coordinating teams, under pressure to show some results, began allocating funds to projects still not ready for implementation. In many instances, these funds simply substituted for other sources of financing, which were re-channelled to other geographic areas and, therefore, did not represent additional resources for all the sub-regions concerned. Moreover, in most cases, projects were prepared on the basis of secondary data, with little or no field work to confirm hypotheses relating to development problems and priorities, and with little direct knowledge of and virtually no participation by target groups. The cumulative result was a program which started out with a diversity of approaches with respect to target groups and the solution of technical problems.

3.53 Sertanejo. The second major program of the 1970s, called the Programa Especial de Apoio ao Desenvolvimento da Região Semi-Árida do Nordeste or Projeto Sertanejo, was established by Decree 78,299 of August 23, 1976. In contrast to POLONORDESTE, which originated with the central government, Sertanejo was elaborated by SUDENE. 1/ Its main objective was to transform the rural economy of the sertão through actions directed to increasing the productivity and drought-resistance of the agricultural sector. In this respect, it more closely followed the sentiments of the Furtado Report than did POLONORDESTE.

3.54 Like POLONORDESTE, Sertanejo was to be coordinated by an inter-ministerial group in Brasilia and a regional team located in SUDENE. Responsibility for the implementation of the program was allocated to DNOCS and CODEVASF, in areas where these agencies already had projects, and to state governments in all other areas. Overall priority was given to projects implemented within the drought-prone area defined by the 800 mm isohyet. This priority area included parts of all the northeastern states, except for Maranhão.

3.55 The initial study leading to Sertanejo, "Carater e Efeitos da Seca de 1970", was prepared for SUDENE by two Brazilian consultants in 1973. Its conclusions were reminiscent of those of the Furtado Report in that it identified temporary workers, sharecroppers, tenants and owner operators with less than 20 hectares as the segments of the rural population most negatively affected by droughts. Despite this finding, the target group for Sertanejo was to be principally comprised of small and medium landowners, although the landless were also included. The lack of emphasis on the landless in the priority categories perhaps reflected a tacit recognition of the difficulties in helping the landless and in modifying the existing structure of land ownership.

3.56 The basic project concept adopted for Sertanejo was the "nucleus". Each nucleus was to have a radius of 30 kilometers, or an area of about 2,800 square kilometers. Infrastructure and various agricultural services were to be concentrated in these nuclei for the purpose of promoting new farming practices among small and medium-sized producers. The emphasis was to be on small-scale irrigation in conjunction with the cultivation of drought-resistant pasture and crops. At the field level, Sertanejo nuclei were to be administered by teams of 30 persons, each team being sub-divided into groups responsible for project preparation, civil works, technical assistance, information and administrative support.

3.57 Conceptually, POLONORDESTE and Sertanejo are quite similar. Though their strategies differ somewhat in detail, they both adhere to the "pole" concept and commonly aim at improving agricultural productivity and incomes.

1/ It is interesting to note that POLONORDESTE was included in the Second National Development Plan (1975-79) while Sertanejo was not. However, SUDENE did include the latter in its regional interpretation (detalhamento) of the national plan.

Furthermore, the geographical areas of these programs' operations overlap in many parts of the semi-arid Northeast, and both receive funds from the same source (i.e., PIN and PROTERRA). In practice, POLONORDESTE tends to assist farmers with less than 100 hectares and Sertanejo, farmers with more than 100 hectares, when their territory coincides.

3.58 PROCANOR. Although the establishment of PIN, PROTERRA, POLONORDESTE, Sertanejo and other regional programs of the 1970s reflected the increasing priority of agriculture in Government policies for the Northeast, these programs largely operated outside of the zona da mata. With the extinction of GERAN in 1971, the most important policies affecting the zona da mata were national in scope, being directed to traditional concerns like regulating the sugar market and, most recently, to promoting the conversion of sugarcane to fuel alcohol (PROALCOOL). 1/ In the meantime, however, changes in land tenure and employment patterns (see para. 2.33) in the zona da mata were fomenting serious labor unrest culminating, in 1979-80, in a series of massive work stoppages among sugarcane workers.

3.59 One official response to the above situation was the establishment of the Programa Especial de Apoio as Populações Pobres das Zonas Canavieiras do Nordeste, or PROCANOR, in April 1980. Like the other special programs operating in the Northeast, PROCANOR is coordinated by SUDENE and implemented by the state governments in collaboration with various federal agencies. Its basic declared objective is to improve the socio-economic welfare of the poor in the region's sugarcane-growing areas through interventions to improve housing and basic social services, increase access to land and promote the production of basic food crops. Though the target area of the program is among the most densely populated in the Northeast, the incremental budget and credit allocations for PROCANOR have been modest thus far in comparison to the other special programs (Cr$500 million in 1980, Cr$857 million in 1981, and Cr$574 million in 1982--all in 1980 prices).

3.60 In order to reduce poverty in the sugarcane areas, the program calls for the concentration of physical and social infrastructure and services in so-called "Intervention Zones" (Zonas de Intervenção or ZINTER). These zones can be existing villages or urban peripheries where the majority of the labor force is landless, or new "agrovilas" where poor families can be relocated. Of the measures to be implemented during the 1981-82 period, those directed to improving access to land were to be given the highest priority. Such measures were to include: a more rigorous enforcement of the Lei do Sítio (a 1944 law which requires sugar producers to provide a 2-hectare plot to each of their permanent employees), expropriation and redistribution of land by INCRA, and financial incentives to sugar producers to donate land to the program. In addition, the IAA was expected to control the expansion of sugarcane production in order to avoid the use of land more appropriate for food production.

1/ The World Bank is helping support PROALCOOL through a US$250 million loan (Loan No. 1989-BR) approved in May 1981.

3.61 Owing to the newness of PROCANOR, an assessment of its accomplishments is not yet possible. However, two general comments may be ventured. First of all, PROCANOR is, in essence, a restatement of one of the four action proposals contained in the Furtado Report (see para. 3.26) -- a proposal which, for political reasons, has remained virtually dormant for over two decades. Though the program formally seeks to bring about a more equal distribution of land in the zona da mata at a time when the area planted in sugar cane by large producers is rapidly expanding and social unrest by sugar workers is increasing, the historical record on this account leaves little room for optimism. A basic conflict is likely to arise between national policies to increase agricultural exports and to substitute petroleum imports, on the one hand, and those aimed at improving the socioeconomic status of the rural poor on the other. 1/ Second, the resources devoted to its activities to date are probably insufficient to accomplish the program's objectives.

3.62 Education and Health. Human resource development has also been given attention. The federal government has launched several programs to improve the education system in the rural Northeast. The Project on Coordination and Technical Assistance to Municipal Education (PROMUNICIPIO) was initiated by the Ministry of Education and Culture in 1975, to strengthen institutional capability at the municipal level. The Program for Socio-Educational and Cultural Activities for Rural Areas (PRONASEC), which started in 1980, represents a first attempt by federal authorities to improve the low salaries of rural teachers. Finally, the Northeast Basic Education Project (EDURURAL/NE) is intended to strengthen primary education, through construction of classrooms, curriculum development, and training of teachers and administrators.

3.63 To improve health care in rural areas, the program for grass-roots health and sanitation actions in the Northeast (PIASS) was established in 1975. In contrast to the system of high-cost curative medical care concentrated in large cities, the PIASS program emphasizes community-based, preventive and simple curative health care and uses local health posts and larger health centers to provide medical care. Medical services are also available for some rural families through the national social assistance fund for rural workers (FUNRURAL), which is part of the social security system.

Toward Common Objectives

3.64 The present Administration, which took office in March 1979, made several decisions which were of fundamental importance to POLONORDESTE and other special regional development programs. First, in relation to the Northeast, it determined that development of the region was a very high priority of the Government and that financial and other resources commensurate with that priority would be allocated to projects and programs for the Northeast. Second, it decided neither to amalgamate existing special programs (e.g., to integrate POLONORDESTE and Sertanejo) nor to create new ones, but rather to strengthen existing efforts.

1/ Implicit recognition of this potential conflict is contained in the PROCANOR program proposal which calls on the IAA to make a special effort to harmonize the objectives of the program with those of PROALCOOL.

3.65 In 1981, however, the Economic Development Council, which authorizes funding for the special programs, explicitly gave all of the special programs in the rural Northeast a common set of objectives, guidelines and target populations. 1/ This proposed unity of purpose was designed to help insure greater consistency among the programs' general and sectoral guidelines and to avoid the duplication of efforts and the dispersion of resources. According to this document, the general objective is to contribute to the eradication of rural poverty in the Northeast by strengthening the productive capacity of small farmers (owner-operators, squatters, sharecroppers, and wage laborers), and by intensifying the process of land tenure reorganization and related agricultural support and social promotion activities, including incentives for the development of cooperative forms of production.

3.66 Subsequent chapters examine the extent to which the POLONORDESTE and water resource programs are meeting their objectives.

1/ Esposição de Motivos, March 1981.

CHAPTER IV

INTEGRATED RURAL DEVELOPMENT

4.01 POLONORDESTE, or the Development Program for Integrated Areas in the Northeast, best exemplifies the integrated approach to rural development in the region. Though its declared objectives and principal lines of action have evolved since its establishment in 1974, the original approach of concentrating a variety of investments and services in geographic areas selected largely on the basis of their agricultural potential has persisted. The integrated rural development projects (PDRIs), which comprise the program, now number forty-three. In addition, there are four colonization projects. Together, these projects cover a geographical area corresponding to slightly more than half of the Northeast (see Map No. 15688).

4.02 The purpose of this chapter is to provide an interim assessment of the approach, consequences, and problems of POLONORDESTE. The lack of quantitative and qualitative data for evaluation make only an interim assessment possible. The program itself is relatively new, and evaluation efforts are just beginning. Moreover, the drought conditions in much of the Northeast during 1979-81 make it virtually impossible to measure the full benefits of the rural development projects.

4.03 Aggregate program data have been supplemented with project level data from the first six projects funded by the World Bank. 1/ The Bank-funded projects are not necessarily representative; a few are older and most are larger, and have been better protected from recent counterpart funding reductions, than the average project. Yet they do provide insights about the accomplishments and limitations of carefully planned and executed integrated rural development projects.

4.04 The first section describes the program -- its objectives, areas of operations, instruments, administrative structure and activities, and the financial planning process. The second section summarizes POLONORDESTE's funding, achievements relative to targets, likely project impact, and problems related to some of the major project components.

1/ The World Bank has been involved in the POLONORDESTE program since its inception. To date, nine loans have been made to finance eight PDRIs and one colonization project (Alto Turi). Almost US$250 million in loan funds have been committed; US$32.4 million had been disbursed as of March 31, 1982, with 40% of the disbursements occurring after April 1, 1981.

A. Description

Objectives

4.05 The Exposition of Motives (EM) of the Economic Development Council (CDE) which authorized funding for POLONORDESTE during 1980-81, for example, declares that the program's basic objective is to remove or alleviate constraints on small farmer development in order to improve this group's living conditions and increase the extent of their participation in the market economy. 1/ A SUDENE report on POLONORDESTE's performance through the first quarter of 1980 reiterates this objective and identifies landless groups (rural laborers, squatters, tenant-farmers, sharecroppers, etc.) and small farmers who own their own land as composing POLONORDESTE's target beneficiary population.

4.06 The objectives of POLONORDESTE have evolved substantially since the inception of the program in 1974. While the original objective of promoting the development and modernization of agricultural and ranching activities in priority areas in the region has not been discarded, POLONORDESTE has gained a stronger "target group" orientation and is now as much concerned with meeting the basic needs of rural families, including landless ones, as with the immediate strengthening of the economic bases of selected microregions.

4.07 The evolution of POLONORDESTE's objectives (and, consequently, its instruments) reflects several factors. Probably the principal factor has been POLONORDESTE's own experience, in a climate of an expanding awareness and public concern with social questions, and the recent political liberalization ("abertura"). Recent changes in the program reflect an appreciation of the limitations involved in applying a growth pole strategy to promote rural development in an area characterized by very low average rural income levels, poor natural resources, periodic climatic problems, and a highly skewed land tenure structure. In short, regional policy-makers have learned that the ability to generate significant benefits for landless workers and very small farmers in the Northeast requires measures which go beyond the standard physical infrastructure-agricultural support service package. Another important factor which has contributed to the changes in orientation of POLONORDESTE is the trend of declining resources (on a per project basis) which has restricted actions in sectors (e.g. roads and electrification) of considerable importance in the program's initial formulation. These observations are further developed below (see paras. 4.27-4.28).

Areas of Operation

4.08 In the federal decree which established POLONORDESTE, several types of "priority areas" were identified: humid highlands (serras), humid

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1/ EMs are formally presented to the Economic Development Council by the Cabinet Ministers in the areas responsible for particular federal programs (in the case of POLONORDESTE and the other special rural development programs for this region, the Ministers of Planning, Interior, Agriculture and Transportation) and are approved by the President of the Republic.

valleys, coastal tablelands (tabuleiros), dry farming areas, and the pre-Amazon region of Maranhão. As noted in the previous chapter (para 3.51), a total of 24 specific areas were initially chosen on the basis of their agricultural potential for the "development pole" strategy. In 1975, POLONORDESTE began the partial implementation of four PDRIs and provided support for several colonization and irrigation projects. 1/ By 1981, the number of projects had increased to 43 PDRIs and 4 colonization projects. 2/

4.09 The PDRIs vary considerably in area and population. In early 1980, when 34 projects were being implemented, more than 500,000 square kilometers in nine states (with a population of over eight million residents in both rural and urban areas) were included in POLONORDESTE's project areas. While the average project areas was on the order of 15,000 km^2, the projects ranged from 341 km^2, in the case of Pindorama in Alagoas to 128,648 km^2 in the São Francisco project in Bahia. Accordingly, the population varied in these areas from roughly 10,000 (Pindorama) to well over a million (Paraguaçu in Bahia), with the average being 250,000.

Instruments

4.10 While many of the original sectoral components of POLONORDESTE continue, new instruments have been introduced, and sectoral priorities have shifted with the evolution of program objectives. Under the original growth pole approach, basic sectoral instruments included public investments for feeder roads, rural electrification, storage facilities, agricultural research and experimentation, and technical assistance and rural extension. A special credit line (for both production and investment costs) was established for use by producers involved in the program, and complementary investments in social infrastructure for rural communities (especially health, education, and water supply facilities) were included. More recently, support for cooperatives, small non-agricultural enterprises, land regularization and redistribution, and fisheries, together with funds for advance crop purchase, have been introduced.

4.11 The number of components used in a project varies across projects. The World Bank, for example, typically funds 10-12 components in a project. For the program in general, land activities, tenure regularization, advance crop purchase funds, and support for small non-agricultural enterprises have been included less frequently than the other components in PDRIs.

1/ POLONORDESTE's support of irrigation projects was discontinued in 1979.

2/ Ceará had eight PDRIs, Piauí and Pernambuco six each, Paraíba and Bahia five each, Alagoas four, Maranhão, Rio Grande do Norte and Sergipe three each, and Minas Gerais one, while Rio Grande do Norte had two colonization projects and Maranhão and Bahia each had one colonization project.

Administrative Structure and Activities

4.12 While institutional arrangements in multi-sectoral programs are usually complex, POLONORDESTE's administrative structure seems particularly unwieldy. It is characterized by multi-level and multi-agency responsibilities, overlapping functions, and complicated mechanisms for the allocation and transfer of funds. POLONORDESTE is administered at four levels: federal, regional, state and local. The principal sectors, functions and responsibilities at each level are described below in an overview of program management. An organization chart (Figure 4.1) gives some feeling for the complex structure involved.

4.13 Federal. The Ministry of the Interior (MINTER) holds formal responsibility for program policy-making and for coordinating the activities of the various sectoral agencies involved in POLONORDESTE at the federal level (Presidential Decree 83.436 of May 10, 1979). While no clear set of guidelines exists indicating the precise roles of the different parties involved in program administration in Brasilia, the Minister of the Interior strongly supports the program and encourages inter-ministerial discussion of its major issues. 1/ In general, MINTER performs routine administrative tasks: channeling resources to the states, monitoring their use, and consolidating reports from SUDENE on POLONORDESTE and other special programs. The federal Secretariat of Planning (SEPLAN) focuses mainly on general policy issues, crucial funding decisions including determination of available program resources, and overall evaluation of special programs. The Ministry of Agriculture (MINAGRI) also participates in decisions regarding POLONORDESTE, but to a much lesser extent than MINTER or SEPLAN. Annual allocation of resources to the program is decided in Brasilia.

4.14 Regional. At the regional level, SUDENE has responsibility for the coordination of POLONORDESTE. Regional coordination functions include setting (together with Ministry technicians) overall and sectoral guidelines for the program, assisting the states in project preparation and annual planning, monitoring project execution, and maintaining liaison with the federal entities involved. SUDENE, in consultation with the states, determines resource needs for individual projects.

4.15 A recent (September 1981) reorganization of the POLONORDESTE coordination group at SUDENE instituted five "implementation" units, each assigned two states, to help with project programming and monitoring and a new group for overall program financial planning and evaluation. 2/ The latter

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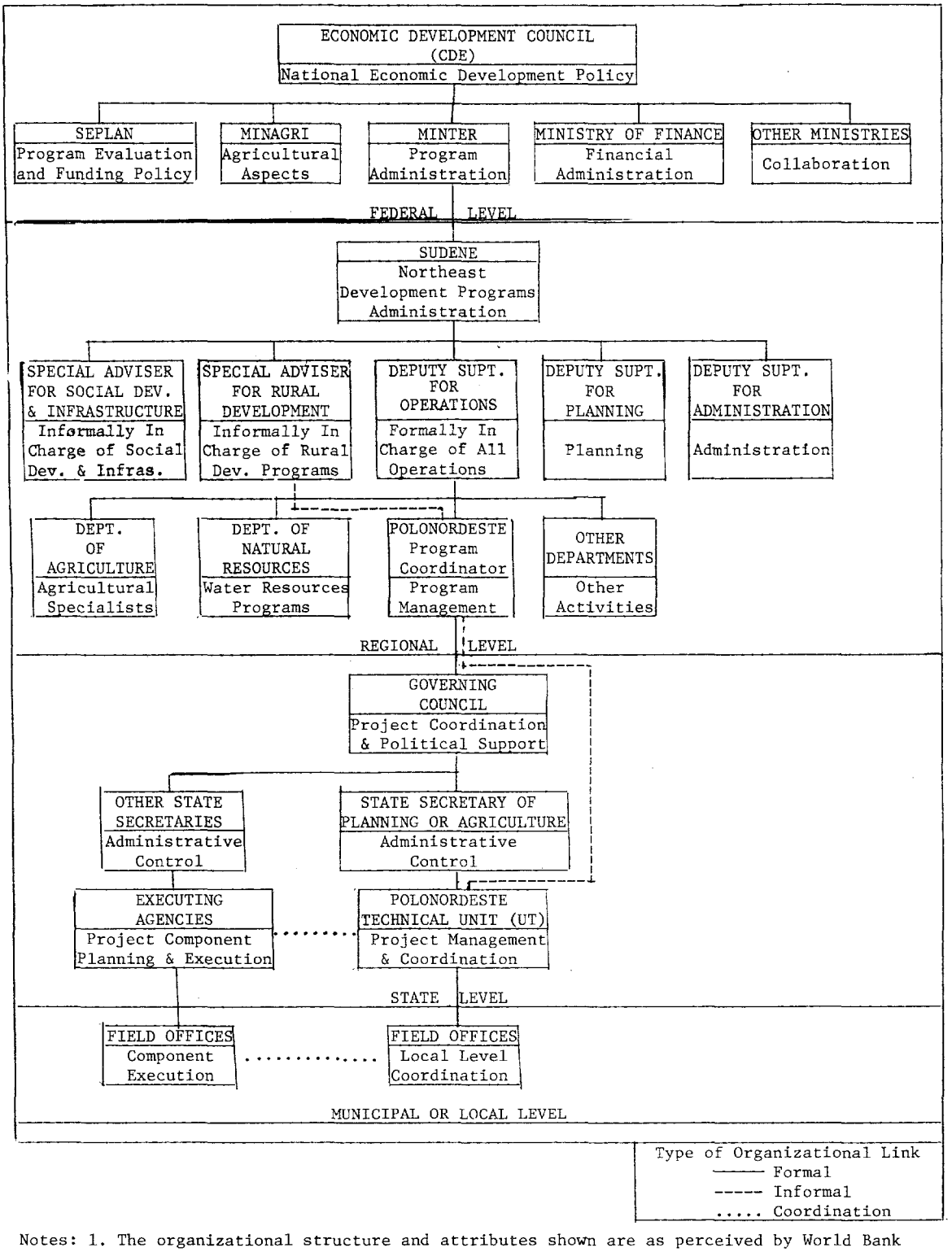
1/ This represents a de facto resurrection of the GECA, an earlier inter-ministerial coordinating group abolished in 1979.

2/ While five groups also existed previously, most of the coordinators have recently changed, and much of the technical staff has been shifted around. Some of the technical staff of the new planning and evaluation sector has been transferred from the program coordination unit of SUDENE's Department of Agriculture and Food Supply. Much of the staff of the former technical assistance sector, in turn, has been placed in one of the implementation sectors.

Figure 4.1

POLONORDESTE PROGRAM ORGANIZATION



Notes: 1. The organizational structure and attributes shown are as perceived by World Bank staff; they are not taken from any official Brazilian source.
2. Within SUDENE, the Special Adviser for rural development is in de facto charge of of rural development programs but this arrangement has not yet been formally approved by the federal civil service commission.
3. While the Governing Council is involved in all formal decisions and communications, certain day-to-day administrative work is carried on directly between POLONORDESTE management in SUDENE and the Technical Units.
4. The Technical Unit reports to either the Secretary of Planning or Agriculture, depending on the state.

replaced two units, one which was responsible for financial programming and the other for sectoral technical assistance.

4.16 Establishment of the planning and evaluation unit reflected increasing concern, on the one hand, with program monitoring and analysis and overall annual financial programming at the regional level and, on the other hand, with improving SUDENE's capacity to provide orientation and technical assistance to the states. However, the recent reorganization of the regional POLONORDESTE coordination team does not appear to have increased SUDENE's ability to contribute effectively to the program. While the states have expanded their capacity to plan and execute integrated projects, and various federal and state line agencies have assumed increasing responsibilities in areas affecting the program, the POLONORDESTE group has gradually declined in influence. 1/ Because of a lack of real power, low salaries, and staff disagreement on objectives and strategies, the POLONORDESTE group has had difficulty in maintaining its technical competence or developing a leadership role in the program. A reorganization of rural development activities in SUDENE in mid-1980 (not yet formally approved by DASP, the federal civil service commission) has not succeeded, thus far, in overcoming the broader problems faced.

4.17 State. The administration of POLONORDESTE at the state and project levels is coordinated by the Technical Units (UTs), subordinated in some states to the Secretariat of Planning and in others to the Secretariat of Agriculture. 2/ The state agricultural planning commissions (CEPAs) are usually involved in project preparation and in some states are also responsible for project evaluation. 3/ There is also a governing council (Conselho Diretor) in each state, consisting of representatives of SUDENE, the official banks and those state secretaries (planning, agriculture, health, education,

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1/ That SUDENE as a whole has been unable to regain the decision-making power it enjoyed in the early 1960s has seriously undermined the Government's decision in mid-1979 to decentralize the responsibility for the special special programs to the regional level.

2/ UTs are linked to Planning Secretariats in Maranhão, Piauí, Pernambuco, Sergipe, Ceará and Bahia and to Agriculture Secretariats in Rio Grande do Norte, Paraíba, Alagoas and Bahia (which is listed twice, as four of the five projects in this state are currently managed by a UT in the Secretariat of Planning, and the fifth by the Secretariat of Agriculture). Field experience suggests that there is no consistent difference in performance or effectiveness among UTs belonging to Secretariats of Agriculture or Planning.

3/ Examples are Ceará, Rio Grande do Norte, Paraíba and Alagoas. Most CEPAs are subordinated to state Secretariats of Agriculture. Ceará, where the CEPA is linked to the Planning Secretariat, is an exception.

etc.) whose agencies are involved in POLONORDESTE programming and execution. 1/ The governing councils in most states meet infrequently and limit their contributions to pro forma approvals of annual planning and monitoring documents prepared by the Technical Units in conjunction with the executing agencies.

4.18 POLONORDESTE projects are implemented by state and federal line agencies which report to state political leaders. Thus, the UTs are obliged to coordinate the activities of agencies over which they have little control, and which do not necessarily give priority to the program or its target population. Some UTs in fact have considerable informal authority, derived from the Secretary to whom they report or from the Governor. Normally, however, UTs cannot impose a particular strategy or set of project activities on the executing agencies. They do not have direct control over project resources and they do not usually have the power to suspend disbursements to agencies which are not complying with the agreed work program or strategy, although they can sometimes get SUDENE to take action.

4.19 The UTs are generally organized into project management units, one for each PDRI, or into small teams of functional specialists responsible for accompanying specific sectoral components across all of the POLONORDESTE projects in the state. While the UTs are located in state capitals, an increasing number of projects also maintain field offices to promote and facilitate greater interaction among the executing agencies and to improve contacts with local communities and project beneficiaries. 2/ This tendency reflects the growing concern within the program to decentralize coordination of the PDRIs and to increase community participation in the planning and execution of project activities.

Community Participation

4.20 Although some of the PDRIs have attempted to foster participation either through specific "community development" components or through components such as health and education which were designed to be implemented and/or maintained by community organizations, the planning and management of POLONORDESTE can best be described as "top-down". During the last several years, however, SUDENE has tried to allocate more resources to community development activities and, as a result, specific components have been included for this purpose. At the same time, most state technical units have been making a greater effort to consult local authorities and community representatives in preparing annual operating plans (POAs). While the general objective of engaging beneficiaries in the planning, execution and supervision of POLONORDESTE projects is laudable, realization of this goal is likely to take a great deal more time and require very careful work on strategy and methodology, as well as considerable flexibility in terms of approach and institutional arrangements.

1/ While the actual composition of the Conselho Diretor varies among the states, chairmanship usually rests with either the State Secretary of Agriculture or of Planning. Recently, however, there has been a tendency for some Governors to assume leadership of the councils (Ceará, Piauí).

2/ The Paraguaçu project in Bahia has three subregional field offices; Ruralnorte in Rio Grande do Norte has two; Ceará, eight; Paraíba, one; Sergipe, one; and Piauí will have three.

Financial Planning

4.21 The availability of funds for POLONORDESTE each year depends, among other factors, on the total quantity of PIN/PROTERRA resources generated, the needs of other special programs, the number of PDRIs, and commitments to external financial institutions to provide supplemental funding for particular projects. Like other special programs, financial planning is essentially carried out with a one-year time horizon, without any established multi-year commitment of federal funds. Funds are disbursed quarterly based on the annual operating plan for the project. There is no financial link between the funding made available at the beginning of a fiscal year and the five-year planning documents which are prepared for most projects and contain targets for each component worked out by the executing agencies in conjunction with the UT.

4.22 Delays in the release of funds to the project level have been common in all states, and is a cause for concern in view of its negative impact on project planning and performance. The procedures are complex for externally-assisted projects. They involve quarterly payments from two separate accounts: one for domestic counterpart funds, and a revolving fund which eventually receives reimbursements from external agencies. Several federal ministries (Planning, Interior, and Agriculture) are involved in releasing the funds, via the banking system to the states and individual projects. A more serious difficulty in maintaining adequate resources is that the domestic source of funds--PIN/PROTERRA--relies on contributions from corporations in lieu of income taxes. These revenues, especially in years of lower industrial profits, do not always meet the needs for funds during the POLONORDESTE fiscal year. As a result of the complex procedures and the temporary shortages of funds, considerable delays in the release of financial resources have occurred, limiting agency operations.

Monitoring and Evaluation

4.23 Monitoring and evaluation serve very distinct purposes. The function of monitoring is to continuously assess progress and identify problems so that management can initiate corrective actions in a timely manner. Generally, it is performed by staff of the executing agencies and the UTs. Evaluation is designed to assess the impact a project has had over a period of years. Impact evaluation studies, often performed by independent researchers, are more likely to lead to broader changes at the program level.

4.24 The monitoring system for POLONORDESTE has been seen as a vehicle for providing data from the project units and executing agencies to the regional and federal authorities, rather than as an input into the routine decision-making of line management. Monitoring indicators have also been oriented toward financial and physical progress, rather than toward measurement of service delivery to and adoption of techniques by beneficiaries.

4.24 The monitoring system is now being re-examined and revised. The quarterly reports filled in by all the PDRIs are now being streamlined based on the results of tests conducted by SUDENE in Rio Grande do Norte and Paraíba. One of the positive changes in the new reporting scheme is the incorporation of more qualitative aspects and the analysis of problems, rather than the purely financial and quantitative indicators supplied under the previous system. Cost control, using constant-price figures, is an area of monitoring which could be further

improved. One of the general difficulties is that different types of monitoring data are required by the various agencies involved, making it hard to agree on a single reporting format. The UTs and executing agencies need considerable detail, while SUDENE, federal authorities and external agencies seek an intermediate level of detail. Certain agencies, such as the state extension agencies (EMATERs), make their own reports to the federal extension agency (EMBRATER) and the UTs, whereas the banks granting POLONORDESTE credit provide no routine information. 1/

4.26 There is no common evaluation system for the POLONORDESTE program, and few of the PDRIs, besides those with external financing, have evaluation components. However, a number of studies have been undertaken. The approaches followed vary widely, from a full-scale and comparatively costly exercise being conducted by the Federal University of Pernambuco (UFPE) for the Agreste Setentrional project, to ad hoc studies on special topics such as citrus cultivation in the Brejo (Paraíba) project. Mid-term evaluations have been carried out in the Ruralnorte and Ibiapaba project areas, and in the Paraguaçu (Bahia) project, annual sample surveys are being carried out to get some impression of socioeconomic changes. While some projects contain evaluation components, they are still a minority of all PDRIs.

B. Results

Level of Funding

4.27 While the number of POLONORDESTE projects has increased, the total level of funding for the program has been erratic. Table 4.1 shows the number of projects and the resources allocated to the program, including foreign borrowing and domestic credit over a six-year period. 2/ Funding declined significantly between 1978/79 and 1980/81. As a result, the program's effectiveness has been strained for several years, as the real resources available on average for each PDRI dropped by over 40% between 1978/79 and 1980/81. This reduction came at a time when many of the projects could have spent effectively more funds than was possible in their initial years of operation. However, the funding shortages may have been of a temporary nature, for the 1981/82 allocations are substantially larger and more timely than those of the previous year.

1/ Detailed comments by the World Bank on the new monitoring system were presented at a seminar held in Recife in August 1981, and workshops were held in Natal in March 1982.

2/ Actual funding data for the program are not available.

Table 4.1

FUNDS BUDGETED FOR POLONORDESTE
(Cr$ billions in 1980 prices)

Year	Budget Allocation*	Number of Projects
1975/76	3.1	4
1976/77	6.8	23
1977/78	7.3	31
1978/79	8.8	32
1979/80	8.1	32
1980/81	7.1	42

Source: IPEA.
* Includes foreign borrowing and domestic credit.

4.28 Funding shortages have constrained all projects, although those with external financing have suffered relatively less. Apart from the foreign resources, the nine projects (including colonization) receiving IBRD and IDB loans absorbed over half the total domestic counterpart resources in 1980/81, leaving the remaining 46% to the other 38 projects. Yet even these nine projects suffered an estimated domestic fund reduction of 40% on average, in relation to their originally estimated requirements. Projects without external financing had a much lower average level of funding and a steeper decline in real terms per project over the past five years. 1/

Component Resource Shares

4.29 The distribution of domestic financial resources across different components of POLONORDESTE projects has also changed. Table 4.2 reveals an increasing emphasis in recent years on agricultural services at the expense of physical infrastructure (credit is not included). The decreasing emphasis on physical infrastructure reflects the changes in program objectives and instruments previously described (see paras. 4.05-4.07 and 4.10). There

1/ The average approved counterpart funding level for PDRIs and colonization projects co-financed by the World Bank (including all projects in Ceara during 1981/82) is roughly Cr$350 million as opposed to Cr$140 million for non-bank financed projects (including PDRIs to be financed by the IDB). Unlike the estimates in Table 4.1, these figures do not include foreign borrowing and domestic credit funds.

Table 4.2

POLONORDESTE Counterpart Allocations by Component, 1975/76 to 1981/82

(Percent of Program Funding) 1/

Subprojects	FISCAL YEAR 1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
Agricultural Services	29	24	34	32	37	42	42
Extension	15	9	14	16	19	21	21
Research	4	4	5	4	4	4	3
Cooperatives	0	1	2	2	3	4	3
Marketing	3	3	4	5	4	2	3
Input Supplies	2	5	7	2	2	2	2
Advance Crop Purchase	0	0	1	0	1	3	0
Selected Seeds	5	1	0	0	1	1	1
Land Regularization	0	1	1	3	3	5	9
Physical Infrastructure	40	40	30	31	27	22	22
Rural Roads	23	32	21	25	23	16	16
Rural Electrification	7	6	7	5	3	3	2
Reservoirs and Dams	10	2	2	1	1	3	4
Social Infrastructure	12	20	17	17	19	17	16
Education	5	9	8	7	9	8	8
Health and Sanitation	7	11	9	10	10	9	8
Other	21	16	20	19	18	21	20
Small-scale Enterprises	0	0	1	0	1	1	1
Administration	5	4	5	5	5	7	10
Support Activities	16	12	14	14	12	13	9

1/ Totals may not equal 100 due to rounded percentages for each component. Credit is excluded from the totals.

Source: SUDENE/POLONORDESTE, February 1981.

Component Resource Shares

seems to be awareness among program planners that physical infrastructure components are less sharply focused on smallholders than agricultural services and credit directed toward small farmers. In all likelihood, the shift in emphasis also reflects the declining quantity of funds available per project over the past five years and the increasing expertise on how to organize and administer agricultural services.

4.30 Rural extension and land regularization activities have experienced the greatest relative increases in funding, rising to 21% and 9%, respectively (as opposed to an initial 15% and 0%), of project spending budgeted for the 1981/82 fiscal year. 1/ The increase is especially sharp for land-related activities and closely reflects objectives and guidelines recently issued by POLONORDESTE management. Altogether, agricultural services (excluding rural credit) presently account for 42% of POLONORDESTE expenditures, as compared with less than 30% in the first two years of the program's existence. In contrast, spending for roads, electrification, and dams and reservoirs has fallen from 40% of the total in the early years to 22% at present. Social infrastructure (primarily school and health post construction) continues to claim a fairly constant 16-20% of total POLONORDESTE funding. While the bulk of POLONORDESTE resources since 1979 (when it ceased financing large scale irrigation projects) have gone to PDRIs (80.4% for 1981/82) and colonization projects (6.6%), the program also supports the Semi-Arid Tropics Research Program (1.8% of 1981/82 funds) and provides funds for coordination at the regional level (4.4% of the current total). 2/ At the state level, roughly 10% of total project funds are presently used for general administration and coordination, including monitoring and evaluation activities.

Targets and Achievements

4.31 POLONORDESTE has enjoyed mixed success in executing its planned activities. Through March 1980, according to SUDENE data, the program's principal quantitative achievements included construction of more than 4,200 kilometers of rural roads and 2,600 km of electrical energy distribution lines benefiting more than 3,000 rural properties; the construction of some 500 schools and expansion and improvement of another 950; and the construction of 250 health posts and 110 community water supply systems. In terms of direct agricultural support, between April 1979 and March 1980, POLONORDESTE assisted close to 38,000 farmers with rural extension services involving an area of 315,000 hectares, and provided credit to 36,000 producers. 3/

1/ It is not known, however, the extent to which the increases are substituted for funds which the federal government would otherwise have allocated directly to the line agencies.

2/ Between 1975 and 1977, for example, 21% and 19% of total POLONORDESTE funds were allocated for DNOCS and CODEVASF irrigation projects respectively. The remaining 6.8% of the resources approved for 1981/82 are reserved for the revolving fund which anticipates reimbursement of expenditures in projects co-financed by external lending institutions.

3/ These estimates are not necessarily consistent with the estimates in para. 4.34 and Table 4.4 for the Bank-assisted projects alone.

4.32 In most cases, actual achievements have been considerably below program targets. Thus in the 1979/80 period, POLONORDESTE assisted only 37% of the farmers originally targeted, even though it was able to contract 97% of the projected number of extension agents. Similarly, the program provided credit to only 18% of the farmers initially anticipated. For the 1975/80 period considered as a whole, POLONORDESTE benefited only 21% of the cooperative members originally planned, and constructed on the order of 30% of the projected water systems and 33% of the programmed health posts. On the other hand, the program was able to attain 76%, 93% and 115% of the targets established for electrical distribution lines, school and road construction, respectively. Performance, from a strict quantitative standpoint, was least impressive with respect to land titling where less than 6% of the initial 1975/80 target was achieved.

4.33 The achievements are not distributed equally among POLONORDESTE projects. The projects themselves vary greatly in size, ecological situation and volume of funding. Not all components are included in each project, and the effectiveness of each component depends on the institutional influence and capacity of the coordinating and executing agencies. The traditionally stronger agencies (e.g., extension, road development authorities) have tended to achieve their physical targets more quickly than agencies with weak administrative capacity or chronically inadequate recurrent cost funding (health services, village water supply). Land distribution and titling have suffered because local institutional arrangements do not exist or are estremely cumbersome.

4.34 Bank-financed projects which are scheduled for completion between 1982 and 1985 appear to have had a somewhat more positive experience in most areas, although again results are not entirely satisfactory. 1/ The assessment is based on the first six projects in Table 4.3.) The achievements in these co-financed PDRIs, through March 1981, generally were about 50-85% of the targets expected to be reached by March 1981 (see Table 4.4). 2/ Under the six co-financed PDRIs, some 36,000 farm families had, as of that date, received extension assistance and 17,000 had obtained rural credit, while 150 schools and 185 health posts had been built. Extension has the best performance record in terms of service delivery (and as measured in terms of percentage of initial target achieved), but this may mask important qualitative considerations. As in POLONORDESTE generally, the greatest shortfall in execution is clearly in the land credit/distribution area. Very little has yet been accomplished vis-a-vis original relatively modest targets of providing land purchase credit or distributing land. However, projects like Paraguacu have been active in land titling and more emphasis is now being placed on regularizing titles.

1/ All Bank projects are expected to require extensions of their original completion date.

2/ The Government allocations and World Bank loan disbursements amounted to slightly less than 75% of the planned allocations through March 1981. Source: Memo of 4/7/82 from J. Coates.

Table 4.3

WORLD BANK CO-FINANCED POLONORDESTE PROJECTS

PROJECT NAME	LOAN AMOUNT (US$ million)	LOAN SIGNING DATE	CURRENT LOAN CLOSING DATE
Integrated Rural Development Projects			
Ruralnorte (Rio Grande do Norte)	12.0	March 1, 1976	September 30, 1982 a/
Ibiapaba (Ceará)	17.0	November 17, 1977	December 31, 1982 b/
Brejo (Paraíba)	24.0	May 8, 1978	September 30, 1983 b/
Paraguaçu (Bahia)	37.0	July 19, 1978	December 31, 1983 b/
Tabuleiros Sul (Sergipe)	26.0	June 20, 1979	September 30, 1984
Agreste Setentrional (Pernambuco)	40.0	June 20, 1979	December 31, 1984
Ceara II (Ceará)	56.0	January 14, 1981	December 31, 1985
Vale do Parnaíba (Piauí)	29.0	August 10, 1981	December 31, 1986
Maranhão	42.7	July 1982 c/	December 31, 1987
Settlement Project			
Alto Turi (Maranhão)	6.7	July 24, 1972	December 31, 1980
Total Lending	247.7		

a/ Originally June 30, 1981. Discussions currently underway on a possible further extension.

b/ Discussions currently underway on a possible extension.

c/ Estimated.

Source: World Bank records.

Table 4.4

POLONORDESTE PROJECT ACHIEVEMENT OF APPRAISAL TARGETS [1]

(For year ending March 1981)

	Quantity Achieved	Percent of Target [2]
AGRICULTURAL SERVICES		
Number of farm families receiving extension assistance	35,945	85
Demonstration plots on farmers' fields	645 [3]	65
Number of rural credit beneficiaries	17,194 [4]	50
Average amount of credit per beneficiary (US$)	1,090	NA
Cumulative number of land purchase credit or land distribution recipients	34	2
SOCIAL INFRASTRUCTURE		
Cumulative number of project-built rural schoolhouses	150 [5]	75
Cumulative number of project-built rural health posts	185	64
Cumulative number of village water supply systems installed	24	19
PHYSICAL INFRASTRUCTURE		
Cumulative feeder roads constructed (km)	1,160 [6]	53

1/ Covers six projects: Ruralnorte (RN), Ibiapaba (CE), Brejo (PB), Paraguaçu (BA), Tabuleiros Sul (SE), and Agreste Setentrional (PE). Ceará II (CE) and Vale do Parnaíba (PI), for which loans were signed in 1981, were not included. Source: E. Senner, "Notes on Rural Development Lending in Northeast Brazil", April 1981.

2/ The targets are cumulative annual targets as of March 1981, which were set at appraisal.

3/ Excludes Paraíba and Sergipe.

4/ Excludes 1,000 (estimated) receiving credit through cooperatives in Sergipe.

5/ Includes 66 under construction.

6/ Includes 209 km under construction.

Impact on Incomes

4.35 Precise quantitative information on POLONORDESTE's impact on farmers' incomes and standards of living is not available. Tentative estimates for the Ibiapaba project, which has better soil and water resources than the average project, suggest that production of certain crops has increased substantially. In the project's humid zone, the production of vegetables, a major source of income, appears to have exceeded 5-year target levels and to have generated as much as a three-fold increase in farmers' incomes. In general, the consensus of opinion (among knowledgeable Brazilian POLONORDESTE project managers and World Bank staff) may be summarized as follows. For small land-owning farmers, some improvement in incomes can be observed, deriving notably from the expansion of cultivated area through the more widespread use of credit. Landless farmers, despite the increasing concern for this group expressed in recent POLONORDESTE documents, have not generally shared in these improvements. Although they have had roughly equal access to upgraded social services and physical infrastructure, their access to credit or to other agricultural services has been uneven.

4.36 When sharecroppers have received production support such as extension and credit, the landowners have sometimes been major beneficiaries. With the higher incomes in Ibiapaba, there have been numerous reported cases of re-negotiation of the owner-sharecropper agreement (always verbal) to the detriment of the sharecropper. In Paraguaçu, official financing for sharecroppers has been welcomed by landowners, as it removes the onus of finding financing and providing inputs to their sharecroppers. Also, under the local terms of the land-use agreement, the sharecropper is allowed to remain a maximum of two years on a given lot. He must then leave it sown to pasture and move into a new area, with the need to clear and fence the land once again. Land preparation and planting are financed directly or indirectly by POLONORDESTE. Thus official finance has often served to capitalize the owners' farm.

Usefulness of Individual Components

4.37 The following paragraphs summarize the experience thus far.

4.38 Extension, Research and Credit. Extension, credit, and applied research appear to have contributed to the increases in yield and planted area noted in some project areas. Extension and credit are considered primary vehicles for assisting small farmers. POLONORDESTE projects have been a vehicle for testing and adopting group extension work in the Northeast. The success of extension work appears importantly related to extensionists' use of these farmers' groups to reach smallholders. Through these efforts, new techniques are being introduced and some small farmers, not previously assisted, are being brought into the formal credit system. Extension agents have helped farmers with the intensive cultivation of garden fruits and vegetables, as well as cotton and tobacco in relevant areas. Nevertheless, the training of extension agents should focus more on cultivation methods and simple on-farm water use techniques which work best with low-income farmers.

4.39 As a result of project experience, EMBRAPA's agricultural research programming has been improved to reflect the needs of particular areas and groups. Nonetheless, a greater research focus on crops grown by small farmers is still needed, as well as better means to improve both the coordination of research and dissemination of research results.

4.40 POLONORDESTE is introducing some small farmers to the use of institutional credit, and is familiarizing them with the procedures to obtain credit through normal channels. It has also helped to simplify the loan application procedures which are required by commercial banks. However, POLONORDESTE credit has benefited only a small percent of the target group so far, because of continued shortages in credit funds. Moreover, the lack of secure land tenure or clear land title reduces the willingness of bankers to lend and the ability of small farmers to take advantage of credit and other agricultural services.

4.41 Marketing. Efforts to improve marketing of agricultural produce have been one of the weaker elements of the package. Many of the existing cooperatives are not well suited to promote the interests of small farmers, given their membership (medium and large farmers) and experience. Efforts to promote new marketing arrangements have often been ineffective, partly because little emphasis has been placed on planning and coordination and on providing marketing information, training, and technical assistance. Although in some areas (notably Ibiapaba) farmers' markets have been able to expand buyers' interest in high-value fruits and vegetables, much of marketing infrastructure financed under the program has not been fully utilized. In essence, cooperative efforts to strengthen the small farmer's position in the marketing process have met with only limited success. Other new approaches have often failed because they were not well-suited to local conditions or because they tried to replace, rather than add an alternative or competition to, the services offered by traditional middlemen.

4.42 Land. The importance of secure land tenure has become increasingly apparent during the execution of POLONORDESTE, since it is extremely difficult to provide agricultural services and asset- and income-building assistance to the landless, one of the major target groups in the program. It has proven particularly difficult to improve the economic position of sharecroppers and day laborers, and larger landlords have not infrequently appropriated benefits intended for smallholders and producers without land. Thus far, efforts to provide land regularization services have been both expensive and slow. Since land purchase credit has generally not been available, alternative measures have included outright land purchase and redistribution (as in Piauí) or regularizing land ownership through surveying and titling procedures. While studies and extensive observation suggest probable productivity gains if underutilized land were made available to smallholders (see para. 2.36-2.39 above), additional land regularization and reorganization must occur in Northeast Brazil before the exact extent of the consequences of greater land tenure security and/or redistribution are clearly demonstrated.

4.43 Water. In POLONORDESTE areas strongly affected by the drought -- such as in the Ruralnorte project area -- it has become clear that effective use of existing water resources or provision of water must be an integral part of many development schemes. POLONORDESTE, thus far, has had limited experience with small-scale irrigation systems and is not currently well coordinated with the water resource use programs which will be reviewed in the next chapter. Better use of existing water sources could be promoted without having to incur the

expense and land tenure and organizational complications of more formal, larger irrigation systems. Increased emphasis on water use will also involve retraining of extensionists and experimentation with a variety of water conserving techniques.

4.44 Infrastructure. An experience common to most of the physical and social infrastructure components is that recurrent cost problems -- salaries and maintenance expenses in particular -- often pose difficulties once project-financed construction is completed. For instance, while a large number of health posts have been built, many are not functioning as planned because of inadequate operational funding (to purchase or replace medical supplies and equipment, to train or retrain attendants, to make complementary investments for electrification and water installations, etc.). Maintenance of rural roads has generally been poor. These problems stem, on the one hand, from POLONORDESTE's tendency to concentrate on the initial construction and installation (but not operation and conservation) of public facilities, and, on the other, from the general financial (and, in some cases, administrative) weakness of the municipalities, which frequently have formal responsibility but lack the means (and occasionally the good will) for their up-keep. This is important since physical and social infrastructure which is not properly equipped and maintained quickly loses its ability to improve incomes and living conditions.

4.45 Infrastructure improvements have helped small farmers, although the benefits cannot be limited to them. Feeder roads, for instance, have facilitated the marketing of produce and the provision of agricultural support services in many areas. However, larger farmers, who produce more and frequently own trucks, and intermediaries have also been helped. Health and education facilities, in contrast, probably benefit largely the poor, who have no means to pay for alternative services. In any event, the transmission of real benefits to small farmers and their families depends on the quality as well as the use of agricultural and social services.

C. Issues and Recommendations

Use of the Integrated Approach

4.46 The case for an integrated approach rests on the use of a package of inputs tailored to meet the specific needs of an area, sufficient to enable the small farmer to increase his productivity and income. Such a package takes advantage of the complementarity between activities. In addition, each project can be limited geographically, for instance to an area of high agricultural potential, and a relatively large amount of resources provided.

4.47 The approach is complicated, in part because of the number of components and the need for coordination among them. The POLONORDESTE program is the first major program to use this integrated approach. Since the program's inception in 1974, there has been major progress toward establishing integrated, target-oriented planning and action by participating Government agencies, as many of the executing agencies work for the first time to coordinate their activities with other agencies or try specifically to reach the rural poor.

Achievements include the introduction of the group extension approach, better focus of agricultural research on the needs of local farmers, improved access of small farmers to institutional credit, and heightened sensitivity to the need for land regularization and titling as a precondition for improving productivity.

4.48 In addition to the normal difficulties of launching any new multi-component program, agencies have also had to contend with the drought since 1979, a nation-wide curtailment of credit which has severely reduced the amount of POLONORDESTE credit available to farmers, and delays in the release of budgeted counterpart funds. Nevertheless, POLONORDESTE is generally considered to be more successful than previous efforts to help the small producer. With the more timely release of POLONORDESTE counterpart funds now in effect, increasing familiarity with the integrated approach by executing agencies, and the cumulative experience and increasing capability for project execution at the state and local level, operations should become increasingly more efficient.

4.49 However, POLONORDESTE has had certain difficulties, not all of which are unique to the program:

(i) Project Costs and Beneficiaries. The principal program benefits have gone to a relatively small number of families. The number of small farmers benefiting directly from the array of agricultural services probably did not exceed 100,000 by 1980. 1/ In contrast, there are about three million low-income rural families in the region. Although actual funds spent in the program in earlier years were usually less than the budget allocations for those years, POLONORDESTE's allocations typically amounted to Cr$7-8 billion per year (in 1980 prices), or US$130-150 million per year. As originally scheduled, the first six Bank-funded projects, which consist of many components and target resources to a relatively small number of beneficiaries, required US$156 million in Bank loans and double that amount of domestic counterpart funds to reach about 66,000 small farmers. 2/ On average, this amounted to almost US$7,000 per direct beneficiary family.

It would be difficult to extend the program as it now stands, with its present array of components and complex management structure, to a large percentage of the rural poor in the region. Project activities currently require a substantial amount of resources per beneficiary, even in areas of good agricultural potential. In addition, resources under the integrated approach cannot be focused exclusively on a target group. Providing physical infrastructure and strengthening institutions (through improved physical installations, the purchase of vehicles and other equipment, the hiring and maintenance of technical and

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1/ The figure is a very rough estimate. It is based on SUDENE's estimate that almost 38,000 farmers received rural extension assistance in the fiscal year concerning 1979-80. Since registered participants almost always receive extension services, the number of direct beneficiaries in 1979-80 was assumed to be equal to 38,000. It was further assumed that the program began to generate benefits in 1977 and that the number of beneficiaries grew every year until 1980. In fact, many of the beneficiaries each year are "repeaters" and not new recipients; therefore, the 100,000 estimate is probably a generous one.

2/ The estimate is taken from the original appraisal reports. Other beneficiaries, such as fishermen and small-scale enterprises, are not included in the estimate.

administrative personnel, etc.) benefit all residents of the area, not strictly the target population. Medium and large producers often benefit (directly or indirectly) as much as small farmers from some project components, such as rural roads, electrification, support to cooperatives and even credit.

Under present budgetary limitations, this type of concentration of resources may be neither possible nor desirable to extend to other projects. With experience and careful selection of components and project areas, costs per beneficiary can be reduced and less expensive, less complex packages utilized; in some cases, of course, some reduction of the rate of return may be necessary. The newest Bank-funded rural development projects, which emphasize land regularization activities but provide a smaller package of services than earlier projects, appear to be less expensive on average than the earlier projects. The average cost per direct beneficiary for the three newest projects has been estimated at about US$3,400. Nonetheless, the cost-effectiveness of future rural development projects should be carefully examined and alternatives considered. For example, creating jobs in small and medium-scale industrial enterprises may be an equally attractive alternative. Stimulating stable wage employment in agriculture may also be a useful complement to improving farm output of small producers.

(ii) Land and Water Constraints. Two long-standing constraints -- land access and usage, and availability of water -- have been major problems in this program, although the newer projects are attempting to address the issues. It has been difficult to design and effectively implement land components in PDRIs in a generally weak institutional environment and a political context in which such efforts have traditionally been resisted. More emphasis on simple on-farm or small-group irrigation systems would require coordination with, and possibly reorientation of, the current water resource programs and an increasing emphasis of extension work and experimentation on water conservation and use.

(iii) Coordination. Effective coordination between existing line agencies is essential and complicated in a program which may use a dozen components per project, executed by agencies at three or four administrative levels. At the operating level, the difficulty in obtaining effective coordination of the project activities of various executing agencies is a prime concern of most state technical units. At times, the executing agencies have to be coaxed to work together, given a strong tradition of (and their general preference for) independent action and reluctance to adopt new objectives or approaches. Yet low levels of cooperation, timing and complementarity of actions in integrated projects weaken the synergetic premise of POLONORDESTE.

Proposed Changes in Strategy

4.50 In view of present revenue constraints, management capability and other difficulties, it is not clear that POLONORDESTE's ambitious goal of raising incomes of small farmers on a broad scale is feasible. Modifications of the basic strategy along the lines described below should be considered. Of course, it is assumed that federal commitment to the program and the institutional and local political support needed to carry out the program's activities will continue.

(i) Target Areas. Experience indicates that a critical level of financing is necessary for project success, and that this level is lower where conditions (soil and climate, local institutions, political support) are favorable for development. Thus it generally seems advantageous to keep the size of PDRIs relatively small, to focus on areas of good productive potential and to limit the number of PDRIs when inadequate overall funding and management capability are a problem. Since virtually every PDRI not receiving external funding has seen its POLONORDESTE allocation reduced in real terms over the past several years, it is recommended that marginal projects be phased out to permit adequate resources for the remainder. A decrease in the number of projects should not imply a decrease in the total volume of funding in real terms. On the contrary, the smaller number of remaining projects could well justify economically a larger total allocation.

(ii) Number of Components. The management and budget of projects can be simplified by using only those components that are strictly needed to do the job. Although there is little evidence that unnecessary components have been included in POLONORDESTE projects, a large number of components makes coordination difficult. In the mission's view, it is critical not to assume automatically, in project design, that a wide range of components will necessarily be needed. Now that a number of POLONORDESTE projects have been designed and implemented, the tendency to standardize projects and to include in each new project every component tried in previous ones should be avoided. The selection of components should instead be based on an in-depth analysis of the needs in a given area, on the interdependence of the various activities, and on the capacity of relevant institutions to undertaken the actions required. As PDRIs focus on areas with good agricultural potential, fewer components may be required to raise farmers' productivity and income than are now used. 1/

(iii) Sectoral Segments. At the same time, when multi-state policy issues or institution-building goals exist, a sectoral approach might be blended with the integrated approach. Rural development sometimes requires broad sector reforms. Issues of policy reform (land issues, for example), program administration (teachers' and medical personnel salaries and conditions of service), basic research and experimentation, and institution-building at the state secretariat and federal levels may best be addressed directly by line agencies. 2/ Project experience can be used to identify state or federal policies which need to be changed in order to improve the rural situation; projects can also be used to experiment with alternatives. This does not mean that a given component would be excluded from new rural development projects. Rather, each project should seek to assure complementarity with the sectoral project, thereby enabling supervision by SUDENE (and the Bank) to be at considerably lower levels.

Improved Implementation

4.51 Even without changes in program strategy, some improvements in the operation of the program can be made. Current implementation at the project

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1/ A pilot project to tailor a minimum number of components to the needs of communities in seven municipalities in Rio Grande do Norte is now being undertaken as part of the Ruralnorte Project.

2/ Initial efforts along these lines are reflected in national research and extension programs and a regional education program, which are all partly Bank-funded.

level is complicated and hampered by inadequate administrative capability and coordination problems. Specific administrative problems are discussed below, with suggestions for change.

4.52 Coordination. Coordination of the activities of existing line agencies, given the degree of institutional complexity, is difficult for project managers (especially field project managers, who have no formal powers over the executing agencies). Existing structures for coordination appear to have mixed degrees of success. The Conselho Diretor concept, in which state secretaries meet under the chairmanship of the Governor or the Secretary of Planning or Agriculture to discuss coordination problems, is not regarded as highly effective in certain states. Field-level coordination, such as that performed in the Paraguaçu project by the regional manager of the Technical Unit (monthly meetings with the regional representatives of the executing agencies), appears useful. This project also has unidades pedagógicas, units headed by the extension service which include representatives of executing agencies and major local figures such as the priest and the rural labor union. These units meet with community groups to identify and help resolve development problems in the area.

4.53 Greater participation by the executing agencies in the preparation phase could help reduce the subsequent conflicts between directives of the executing agency and those of the program, by working out potential conflicts and creating complementarity with other programs. More specific agreements could also be worked out between the UTs and the executing agencies in certain cases. For instance, in addition to the Annual Operating Plan, updated service contracts could be negotiated annually with the executing agencies. These would specify, in the detail required by the Technical Units, inputs to be applied and results to be obtained, with adjustments to funding levels in the event of non-compliance.

4.54 Organizational Capacity. The lack of organizational capacity in some executing agencies to carry out their component of the project has caused problems. This may stem from inexperience, either with the assigned task or with the integrated approach required, or from difficulties in getting the prefectures to comply with the project. It may also reflect bureaucratic procedures which inhibit efficient progress. Successful components, in the eyes of POLONORDESTE project managers, are often those which manage to operate with a less bureaucratic approach; in this regard, rural credit is often mentioned favorably since considerable efforts have been made to simplify loan application procedures. For the POLONORDESTE program to work, the philosophy of integrated assistance to small farmers and the rural poor must be accepted by each executing agency. This change in approach by the agencies carrying out line activities is perhaps as important as the actual project activities themselves. The POLONORDESTE program is not expected to last forever; in the long run, it is the normal executing agencies which must bear the responsibility for providing public services to the rural population.

4.55 Staffing. Staffing is of key importance to a program which seeks to promote social and economic change, and, recently, high turnover, especially the regional level in some agencies, has been a problem. Inadequate salaries are one of the reasons for the departure of qualified and motivated staff, and the existing salary structure of at least some participating entities needs to be revised and other incentives given to reduce turnover of experienced personnel.

At the state level, Technical Units and executing agencies have often established themselves as autonomous entities or linked themselves administratively to local agencies with the most salary flexibility in order to provide competitive salaries.

4.56 At the SUDENE level, a subsidiary company which had been established in large part to allow more generous employment conditions was abolished due to spending cuts in the spring of 1981, causing substantial salary cuts and diminished future prospects for SUDENE employees. Within several months, many of the experienced members of the POLONORDESTE team in SUDENE resigned to take better-paying jobs elsewhere. Better remuneration of SUDENE staff alone, however, will not be sufficient to attract well-qualified managerial and technical personnel unless the erosion of SUDENE's powers is checked and the institution is clearly seen to have important functions to fulfill.

4.57 At the execution level, the remoteness of posts linked to rural development projects has been an important factor in high turnover. In some projects, it has been hard to recruit field staff for distant outposts. A constant turnover develops, as in the extension services. In the past, inexperienced staffers were assigned to the most remote locations, but as soon as they gained some experience, they gravitated toward the more desirable locations close to the coastal cities. In Maranhao, this trend has been reversed by paying more for posts in remote locations.

4.58 Training. Training needs are apparent at both the Technical Unit level and within the various executing agencies, although project management capability has developed with experience. Project personnel are receiving some training, but it does not seem to be consistently pursued or coordinated across the whole POLONORDESTE program. In Ceará, for instance, executing agency personnel up to the level of state secretary were sent for training to the Fundação para Recursos Humanos in Rio Grande do Sul. In the Rio Grande do Norte Technical Unit, there is no one specifically in charge of training, and no organized, broad instruction has been made available in such topics as POLONORDESTE program objectives or agricultural policy. In Sergipe, EMATER staff and the leaders of rural communities were trained by the Technical Unit in the objectives of the project, but training for the UT personnel has been ad hoc, such as a brief visit to the Ibiapaba project area to exchange ideas.

4.59 Training needs clearly exist as well at the technical level within the executing agencies. For instance, extension agents often arrive ill-prepared for their task; in some cases, the lack of experience is due to high turnover and, in other cases, the substantive content of their training is inappropriate.

4.60 Technical unit personnel need more training in the components under their control and more opportunity to exchange experiences. Existing efforts, such as the BNB-administered training program in rural development (which has trained about 400 people so far) and the work with individual Technical Units being carried out by the OAS assistance team to SUDENE, need to be supplemented by greater opportunities for discussion among POLONORDESTE staff. More technical assistance support could be solicited from federal agencies like EMBRAPA and EMBRATER, if not from SUDENE itself.

4.61 Management-oriented sessions on the following topics would also be useful:

A. Methods of Coordination. Practical aspects of achieving goals through line agencies over which direct control is not possible.

B. Planning and Programming. Philosophy of annual and multi-year planning, and guidance on latest POLONORDESTE Annual Operating Plan preparation.

C. Cost Consciousness. Introduction to concepts of unit costs, correction for inflation, analysis of variance, and cost-effective procurement practices.

D. Monitoring and Evaluation. Assessment of project shortfalls on a continuous, timely basis to allow for adjustments.

4.62 Flow of Funds. Late arrival of funds at the project level has been a major cause of slow project execution. POLONORDESTE's complicated system for allocating and releasing funds, despite various modifications at different stages, remains highly centralized and allows for little discretion in the management of funds at the state level. Delays in POLONORDESTE funding are probably due to a combination of factors: the absolute shortages of PIN/PROTERRA resources in certain periods, particularly in the first quarter when receipts are slow to accumulate, the periodic attempts to curb government expenditures, and the complexity of the funding system. Therefore, improvements in the latter factor would probably not eliminate the delays, but could shorten them.

4.63 Possible solutions might involve providing more flexibility and control at state and regional levels and simplifying the funding procedure. Decentralization of decision-making authority could be reflected in changes such as: (1) giving to states some flexibility to transfer funds among components; or (2) establishing POLONORDESTE revolving funds in each state, in order to provide liquidity at the level of project execution. This would help ensure against the late arrival of funds from Brasilia.

4.64 This decentralization could be accompanied by a simplified funding process. For instance, all POLONORDESTE funds could be channeled directly from the Ministry of Finance to a single account within each state, from which the UT would make disbursements to the executing agencies. Additionally, substantial strengthening of the five-year project plans could provide the basis for approval of multi-year funding levels. The annual operating plans could then be greatly simplified, and used only to justify deviations from the original financing plan.

Bigger Role for Evaluation

4.65 Evaluation deserves greater attention. Reliable feedback about the effectiveness of various project components and strategies are needed, especially in the face of limited financial and human resources. Lengthy studies of the sort being performed by the University of Pernambuco (see para. 4.26) are probably too expensive (probably US$1-2 million per project) and, therefore, would be practical for only two or three POLONORDESTE projects at a time. As a more standardized procedure for all projects, simple impact studies, such as those being conducted in the Paraguaçu project, could be instituted. This would involve a fairly inexpensive annual sample survey, beginning with a baseline study and then measuring changes in employment, incomes, farm productivity and area cultivated, and other key variables for assisted and non-assisted farmers. By keeping the sample size relatively small and utilizing students for data collection, costs could be kept modest while still obtaining useful insights into the local development process.

4.66 An alternative procedure would be to build key indicators into the current monitoring system for evaluative purposes. While it is difficult to obtain some types of data in this manner, the indicators would provide a core of information which could be supplemented by visits to selected sites or used in conjunction with sample surveys.

Proposed Adjustments to the POLONORDESTE Program

4.67 Discussions are already well underway in Brazil on ways to improve the effectiveness of POLONORDESTE while continuing its focus on the poort farmers in the region. The ideas being considered among the executing agencies include:

(a) better focus on direct production support to poor farmers;

(b) renewed efforts in areas with some of the more difficult agronomic problems (drought polygon), in areas where good agronomic potential is not always optimally utilized because of social and land tenure conditions (zona da mata and agreste areas), and in areas with the capacity to absorb reasonable numbers of poor farmers (areas with irrigation potential and frontier development areas in Maranhao, Piaui, and Bahia); and

(c) address the land tenure issue decisively and on a large scale, and promote adoption of more drought-proofing water and soil use and management techniques at the small farm level.

4.68 Strategies being considered by government authorities to achieve these objectives include:

(a) a consolidation of the various special programs directed to the selected target group in the same areas, and improved complementarity and linkage between special programs overall;

(b) simplification and greater selectivity in the design of new interventions and the possible development of parallel but coordinated packages of support for production services, infrastructure development, and social services;

(c) a greater involvement of INCRA in systematic land discrimination activities and COLONE in settlement activities;

(d) greater emphasis on staff training and institution building activities;

(e) streamlining of planning, implementation, coordination and monitoring/evaluation mechanisms, and of funding and agricultural credit arrangements.

4.69 This redirection of strategies and operations is promising and and is now being refined and developed in terms of overall Government objectives and strategies for development of the Northeast (see paragraphs 6.27 to 6.34).

CHAPTER V

DROUGHT RELIEF AND WATER RESOURCE PROGRAMS

5.01 The recurring "drought problem", which has caused widespread human suffering for at least 150 years in the semi-arid interior of Northeast Brazil, is one of the key constraints of the region. It has its origins in climatic phenomena, namely the low level, great variability and uneven distribution of rainfall in much of the Northeast. Yet the impact falls disproportionately on the sharecroppers and smallholders of the sertão, always close to the economic margin and therefore highly vulnerable to the risks of climatic hardship. Particularly serious droughts have occurred recently (in 1970, 1976 and 1979-81), refocusing attention on the problem and possible solutions.

5.02 Major public programs are addressing both the immediate drought relief needs and the longer-term requirements for better "drought proofing" the Northeast. In the broadest sense, all of the longer-term water resource programs have the same basic objective: the provision of water as an input to agriculture. In refining that objective, however, significant differences can be found between the large irrigation programs and those oriented toward small-scale irrigation and simple on-farm water use activities. The large irrigation programs emphasize economic efficiency and are directed toward commercial production and the generation of employment and income for wage labor. The small-scale programs, in contrast, give more weight to protection of harvests of small farmers, even under severe drought conditions, rather than commercial production per se.

5.03 This chapter reviews the experience of the water resource programs in terms of their impact on small farmers, and their consistency with the approach being taken by the integrated rural development programs. Three different types of programs are covered: 1/

(i) Emergency Drought Relief

(ii) Programs to improve the resistance of farmers to the drought

- Large Irrigation Programs
- Sertanejo Project;
- Water Resource Use (PROHIDRO); and

(iii) Semi-Arid Tropics Research Program

General conclusions are presented at the close of the chapter.

A. The Emergency Drought Relief Program

5.04 The Government's most immediate and most expensive means of alleviating drought effects over the years has been to provide temporary employment and relief food supplies to drought-stricken northeasterners. Although

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1/ In addition, the government is extending the Provárzeas Project to the Northeast. Provárzeas offers subsidized credit for installing on-farm irrigation and drainage networks. At the present time, there are no restrictions related to farm size.

drought relief is organized on an ad hoc basis, somewhat differently in each drought year, it is a politically popular program and has become, especially in light of the persistent droughts in the 1970s, a major system for resource transfer to the Northeast. One of the ironies of a program which arose from short-term, humanitarian needs is that the money and credit are now almost built into the expectations of the population.

5.05 Prior to 1979, drought relief primarily took the form of work fronts (frentes de trabalho) which employed displaced laborers and smallholders in large scale public work projects where they received a subsistence wage and food allowance. This system had serious disadvantages, however, including the high costs of transporting drought victims to often distant work sites, problems of supervision, and misuse of relief supplies. As a result, for the 1979-81 drought, a new approach designed to provide temporary work opportunities on nearby farms and local communities was taken.

5.06 The 1979-81 drought affected areas in Piauí and Sergipe, as well as even larger parts of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas and Bahia. As in previous droughts, the crops that sustained the highest losses were corn, beans, and cotton, but even rice production declined in some areas. Curiously, the total amount of rainfall in 1980 was superior to that in 1979 in much of the semi-arid part of the region. The principal cause of the decline in output in 1980 was the extreme concentration of precipitation in a single month (February). In 1980, parts of the agreste were also affected by the drought.

Objectives

5.07 Emergency drought relief (Plano de Emergência) in 1979/81 had two basic objectives: to provide temporary assistance to drought victims and to strengthen farms against future calamities. An underlying concern was to retain affected populations near their areas of residence, thus attempting to reduce out migration and the splitting up of families, and avoid possible invasions of towns and larger cities by drought refugees in search of food and other provisions as had occurred in earlier years.

5.08 The basic strategy consisted of transfers to laborers and credit to landowners to finance farm improvements. Specifically, the program involved the following instruments:

(i) a labor support program in the first two years of drought to employ rural workers -- paid 100% by the program -- in productive on-farm investments. For properties up to 50 ha, a maximum of 3 persons could be employed; for 50-100 ha, up to 5 persons. Properties over 100 ha were not eligible.

(ii) availability of a special unindexed investment credit line. In 1980/81 the credit was at 7% interest over 12 years, to owners with more than 100 ha or who had not participated in the labor support activity. In 1981/82, interest was set at 15% for small producers, 25% for medium producers, and 35% for large producers.

(iii) a water supply program using tank trucks, and a works program to build reservoirs.

(iv) a community work program, in which workers paid under the labor support program could devote two days per week to group work on community projects.

(v) various sub-programs such as provision of foodstuffs to the neediest population, distribution of seeds, and emphasis on additional food production in irrigated areas.

Results

5.09 Between April 1979 and May 1982, a large amount of resources was allocated for drought relief effects as shown below:

	Fiscal Resources	Credit
	(Cr$ billion in 1980 prices)	
April 1979/March 1980	12.8	4.6
May 1980/May 1981	24.9	12.6
June 1981/May 1982	34.4	2.4

Source: MINTER, Seca 1981/82, Programa de Emergência, June 1982.

The emergency credit allocation in 1980/81, for example, represented 60% of the total value of credits disbursed for all special programs in the Northeast (including PROTERRA, POLONORDESTE, Sertanejo, PROALCOOL and others) between January 1 and July 31, 1980 and was about five times more than the credit funds actually utilized by POLONORDESTE in all of 1980. Since Cr$10 billion were requested from the National Monetary Council for the latter program in 1980, but only Cr$5 billion were approved, the Drought Relief credit may have substituted for POLONORDESTE funds. At least part of the Emergência effort has been financed with resources which would have normally reached the Northeast by other channels.

5.10 As of February 1981, the labor support program was paying Cr$3,000 a month (equivalent to about 70% of the legal minimum salary) to about 660,000 workers. By May 1982, the program had helped to support an average of 780,000 workers in each of the three drought years.

5.11 The physical achievements of the program also appear to have been substantial. According to Emergência sources, 102,000 small and medium reservoirs, community wells, and individual cisterns with a total capacity of 6.0 billion cubic meters of water were constructed or expanded, and another 67,500 smaller water-related works were built or improved. In the

area of basic sanitation, 50 simplified water supply systems benefiting 200,000 persons, 500 water storage tanks to supply potable water to 100,000 persons, 170 kilometers of small aqueducts, and 350 public water spigots were copnstructed. In addition, roads, bridges, public buildings and rural housing were improved, silos and irrigation canals constructed, and land cleared, planted, and harvested.

General Observations

5.12 In many respects, the emergency assistance was quite successful. A record number of people were assisted without having to leave the countryside and very few deaths were reported despite the dramatic decline in staple food production (in many areas for the second consecutive year). Considerable rural infrastructure also was created.

5.13 The program had mixed success, however, in benefiting small and, particularly, landless farmers. On the one hand, while labor support payments were increasingly directed toward smaller properties, on the other, much of the credit was utilized by medium and large producers. SUDENE data on drought relief works in 1979/80 reveal that pasture formation and land clearing accounted for 84% of investment, further suggesting that most of the credit was received by larger producers.

5.14 Permanent strengthening of small farmers against the drought was generally not achieved. Smallholders appear to receive a disproportionately small share of drought funds (other than labor payments or subsidies) and, consequently, have less opportunity to increase their resistance to future calamities by acquiring livestock, building small reservoirs or wells, constructing silos or installing irrigation. Many are not eligible for aid because they lack the necessary INCRA land title. Lack of technical assistance -- local administration of the drought program has generally been assigned to rural extension agents, thereby diverting them from their normal activities -- and difficulty in acquiring seeds for planting compound the longer term problems faced by poor farmers in recovering from the drought. In addition, the geographical distribution of the relief funds is frequently irregular, with some areas receiving assistance for only a portion of those adversely affected. Finally many of the structures built with relief funds have technical deficiencies. For instance, almost 90% of the small dams built in Rio Grande do Norte under the emergency programs were washed out during the torrential rains of March 1981.

Recommendations

5.15 In view of the regularity of droughts, an opportunity is currently being missed to improve the capacity of small producers to resist drought on a more permanent basis with this program. The Emergência program, when activated, would be more useful if it were incorporated into a long-range water resource and rural development planning effort for the region. If possible relief activities should be planned in accordance with local needs and better coordinated with the special programs to develop an integrated set of measures to increase

the productive capability of small farmers.1/ In this way, drought relief and rural development programs would complement one another geographically and strategically, rather than enter into conflict -- over the use of extension agents, for instance - as currently appears to be the case. At the minimum, there should be a more careful elaboration of contingency plans to deal with emergencies.

B. Large Irrigation Programs

5.16 Although irrigation as part of an anti-drought strategy was first proposed in the 1890s, it was seriously considered in this connection only after the severe 1950 drought. As noted previously (para. 3.11-3.12), since its inception (as IFOCS) in 1909, DNOCS has concentrated almost exclusively on reservoir building, while doing little to spread the benefits of billions of cubic meters of stored water to the drought-vulnerable small farmers in the sertão.

5.17 The first systematic irrigation plan for Brazil, published in 1971, proposed irrigating 195,000 hectares in the Northeast by 1980. DNOCS would have responsibility for 36 projects scattered throughout the semi-arid region, while CODEVASF (established in 1974 to succeed SUVALE) would be in charge of another 17 in the Sao Francisco river valley. The plan projected the creation of 115,000 direct jobs and twice this amount of indirect employment. Including dependents, the total number of direct and indirect beneficiaries was projected to exceed one million people, or more than 5% of the rural population in 1980. According to the plan, farmers incorporated into the projects would receive yearly incomes as high as ten times that outside of irrigated agriculture from the cultivation and sale of high-value fruits and vegetables.

Objectives

5.18 The principal objectives of the irrigation effort were, thus, to increase employment, income, and agricultural output in the semi-arid Northeast (DNOCS) and São Francisco river valley (CODEVASF). DNOCS, more specifically, has proposed the following general goals, combining drought prevention and water use concerns:

i) the improvement of areas through the construction of works against the drought and/or floods;

ii) the establishment of irrigation districts;

1/ For example, water resource development and other rural works (schools, access roads, etc.) which are already planned under the special programs might be accelerated with complementary Emergência funding during droughts. This coordination of activities would not only achieve longer-term project objectives but also generate short-term employment.

iii) the settlement of rural families in communities of irrigation farmers; and

iv) the undertaking of other activities of basic development and assistance in the case of regional public calamities.

5.19 Irrigation programs receive the largest share of internal budget allocations, although that share has been declining in recent years. 1/ DNOCS is also concerned with various water-related activities, including the study of regional water basins, the elaboration of master plans and construction of public works for the catchment, conduction and use of water resources, the promotion and diffusion of technology geared toward the improved use of water resources and protection against the drought, and the development of fisheries in Northeast inland waters. Furthermore, DNOCS and CODEVASF are also directly involved in the administration of many of the Sertanejo Project nuclei when these coincide with irrigation perimeters. DNOCS' area of jurisdiction corresponds to the "Drought Polygon", involving large parts of all of the northeastern states (as well as northern Minas Gerais) except Maranhão.

5.20 CODEVASF has as its basic mission promotion of the economic development and utilization of natural resources, especially soil and water, in the São Francisco river valley. Since the late 1960s (still as SUVALE), its main activity has been to identify priority areas for irrigation and agricultural development together with the implementation of selected projects. 2/

5.21 CODEVASF's plan of action for 1981/85 gives considerable emphasis to irrigation, through both the development of large-scale projects and support to small-scale ventures. The latter are to be assisted largely through the use of rural credit for private properties. Targets set for the 1980/85 period include the incorporation of about 111,500 hectares under irrigation, of which 51% are to be by larger commercial firms and the remaining 49% by a total of 9,100 families, at an average of six hectares per family. The direct creation of slightly over 100,000 jobs is expected. A total of

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1/ In 1979, for example, 41% of DNOCS' total budget of Cr$5.5 billion (in 1980 cruzeiros) involved irrigation expenditures. On the other hand, since 1976, when they accounted for 52% of the total, irrigation programs have represented a declining share of DNOCS' budget, which has also decreased steadily in real terms (from Cr$8.1 billion in 1980 cruzeiros in 1975).

2/ The World Bank has made two loans to help farmers in the Lower São Francisco. The first was intended to protect about 32,000 ha of *várzea* land after the hydroelectric development upstream caused a permanent change in the river flow. The second is to provide irrigation facilities and other agricultural assistance to increase production on family farms covering about 9,000 ha of flood plains.

12 projects (including five in Minas Gerais) will receive investments over the six-year period of Cr$13.4 billion (in 1979 prices). This represents 55% of total expected program expenditures between 1980 and 1985. 1/

Institutional Structure

5.22 DNOCS' central headquarters is located in Fortaleza and, since early 1980, regional directors have been installed in each of the states where the agency operates. 2/ At the project level, decision-making is quite centralized, permitting little participation by the beneficiaries. Despite their membership in project level cooperatives, beneficiaries have virtually no decision power, since these associations are tightly controlled by local DNOCS management and technical staff. Studies for site selection and preparation are normally contracted to private engineering firms. Generally, the irrigation districts are established in valleys which possess DNOCS-constructed reservoirs. CODEVASF, in contrast, has its headquarters in Brasília and operates somewhat more like a private sector development company with planning, coordination, and executive functions.

Results

5.23 As of mid-1980, there were 39 irrigation projects under DNOCS' responsibility, of which 24 were in operation, seven under construction and eight in the planning stage. More than a third of the total number of projects to be developed would be located in Ceará (including nine of those currently in operation) with the balance being more or less evenly distributed among the states of Paraíba, Pernambuco, Rio Grande do Norte, Piauí, and Bahia. In the DNOCS' projects, irrigated lots average six ha, settled by families averaging six members with about 2.5 full-time permanent workers. Slightly over 75% of the settlers are members of marketing and supplies cooperatives (of which there are a total of 12) promoted by DNOCS. In December 1980, CODEVASF reported 21 projects in operation in the states of Bahia (10), Minas Gerais (5), Pernambuco (3), Sergipe (2) and Alagoas (1), with an average of 132 families and almost 1,750 ha per project. 3/

1/ Other expenditure items include land expropriation and cadastre, basic studies, engineering projects, support programs (involving the provision of physical and social infrastructure and agricultural support services), debt amortization, and general administration. Of the total funds required, 58% were expected to come from PIN, 20% from BNDE, 11% from external financial institutions including the World Bank (with 5% of the total) and 9% from other sources.

2/ Prior to 1980, regional directorships were located in Fortaleza, Recife, Salvador and Teresina, each having responsibility for one or more states.

3/ Of the total area reported in CODEVASF projects, 54% was settled by small farmers and the remaining 46% ha by firms.

5.24 In reality, the targets set for the irrigation projects have proven to be highly optimistic. Of the 22,000 families DNOCS had hoped to install by 1980, only 2,957 (13%) had been absorbed. Similarly, of the 100,000 ha DNOCS expected to have irrigated by 1980, only 14% (14,270 ha) was achieved. CODEVASF demonstrates only a marginally better rate of success, irrigating only 9,800 ha of a 50,000 ha target (20%) and settling a total of 2,780 families by the end of 1980. Thus, ten years after the ambitious national plan, less than 0.2% of the Northeast's rural population has directly participated in formal irrigation schemes and less than 5% of the original target population has been effectively incorporated in the DNOCS and CODEVASF projects. Overly ambitious initial planning, technical and managerial inexperience, rapidly rising costs, and budget cut-backs have accounted for the shortfalls. The limited capability and experience of project beneficiaries with organized irrigation tasks have also caused delays.

General Observations

5.25 Generally speaking, the large-scale government irrigation projects tested in the Northeast have proved disappointing both in terms of the limited achievement of their initially very ambitious employment, income and production objectives and as anti-drought strategies. The high farmer incomes predicted have materialized for only a small minority, and many settlers find themselves in debt, undoubtedly contributing to the high rate of producer turnover. The irrigated land has generally not been used to produce high value crops, owing to poor soils and lack of managerial capacity and organized marketing. Instead, traditional crops -- cotton, rice, corn and beans -- occupy an average of 75% of the irrigated area and account for 68% of the production value in DNOCS' projects (representing, for example, 97% and 82% of the income generated in two of the largest areas -- São Goncalo in Paraíba and Morada Nova in Ceará).

5.26 Inadequate initial training and on-going technical assistance contribute to the poor economic performance of the projects, while the salinization of soils in as much as 30% of the land under irrigation has also resulted in crop losses. The latter is directly related to inadequate water management and drainage techniques; while salinity problems in completed projects are costly to correct, CODEVASF, with technical support from FAO, is now developing ways to prevent salinization in current and future projects.

5.27 The program has been very costly, despite the small number of jobs created by DNOCS and CODEVASF irrigation schemes. The average cost per hectare is about US$13,000 (including land cost, farm improvements and community infrastructure, but excluding central installations). DNOCS and CODEVASF together spent about Cr$8 billion (US$150 million) on irrigation in 1980.

5.28 Irrigation projects have also suffered from high social costs due to displacement of the existing population. The largest DNOCS scheme (Morada Nova), for example, displaced 18,000 persons to make way for an eventual 3,000 people, of whom two-thirds had been settled by 1980. 1/ When CODEVASF expropriated lands in the lower São Francisco valley to set up the Propria-Itiuba project, many of the dispossessed waited several years for any compensation or repossession of irrigated plots. Class action suits and

1/ Excluding the additional workers expected to be hired on the irrigated land.

church involvement underline the tension which arose. Though no detailed study of displaced farmers has been undertaken, the evidence suggests that many leave the valleys and drift to urban areas, thus contradicting one of the goals of irrigation strategy, namely, to stabilize labor in the countryside.

5.29 There has been considerable dissatisfaction on the part of the settlers with the irrigation project management, particularly with the cooperatives in the DNOCS projects. From the moment a colonist enters a project he is apparently told how much land he may cultivate, what crops to grow, what treatment to apply, when to harvest and to whom he must sell his produce. No collective decision-making is allowed among settlers, and criticism of project management is discouraged. In one official survey of 19 DNOCS schemes, 80% of the colonists interviewed were dissatisfied with their cooperatives for a variety of planning and marketing related reasons.

5.30 At the regional level, planning and coordination for irrigation activities have been weak. There is little coordination between DNOCS and CODEVASF, or between these agencies and the irrigation components of other special rural development programs, except in the case of DNOCS or CODEVASF Sertanejo nuclei. In addition, large-scale irrigation for the region appears to be of diminishing importance for the federal government, as indicated by trends in general resource allocation. For example, the irrigation budget for 1980 represented only 44%, in real terms, of the amount allocated in 1978, with DNOCS being particularly affected. 1/ However, the government is now formulating a more coordinated irrigation strategy (see para. 5.66), which has the potential of improving the irrigation programs.

Recommendations

5.31 Large-scale irrigation programs have generated large economic and social costs and have done little to make the region and its small farmers less vulnerable to the drought. At this point, large-scale irrigation systems are probably too expensive and difficult to be the major focal point in efforts to help small farmers. Programs using simpler techniques appear to have a greater potential to reach larger numbers of the drought- vulnerable population at a a lower cost per beneficiary, though perhaps with more modest production targets. Several kinds of small-scale irrigation schemes, with run-of-the-river water diversion systems supported by reservoirs, ground water exploitation, and small dams or reservoirs, could be used. Since all require some central infrastructure investment, some Government funding probably would be necessary.

5.32 In certain areas such as the São Francisco river valley, large-scale irrigation projects are likely to continue, stimulated, for example, by the expansion of sugarcane cultivation and alcohol production under the PROALCOOL program. These projects are based less on the family plot system and more on large production units using wage labor. Nevertheless, it is important to protect the small landholder by adopting fair land expropriation and compensation procedures and amounts for smallholders who are displaced, even if they do not have legal titles but are de facto owners; and by providing alternative land and housing for displaced families, minimizing delays to the extent possible.

1/ In practical terms, this means that a growing share of DNOCS budget is taken up by administrative costs at the expense of other activities, including irrigation. It is, perhaps, indicative that DNOCS total staff is 5,000 as compared with less than 3,000 farmers settled so far in irrigation projects.

C. The Sertanejo Project

Objectives

5.33 The basic objective of the Sertanejo Project is to intervene in the semi-arid zone of the Northeast to make agricultural activities more resistant to the drought and to promote development possibilities. As indicated above (para. 3.53-3.57), this program was created in August 1976, the result of an initiative by SUDENE. Its general objective has been broken down into three more specific areas of concentration:

i) to organize and equip farming and ranching units in the semi-arid Northeast, especially small and medium ones, by giving them greater capacity to resist the effects of the drought;

ii) to prepare farmers for the more rational use of their properties and resources in order to increase and stabilize their income levels and eliminate or reduce difficulties during prolonged droughts; and

iii) to alleviate social problems which afflict the semi-arid region by inducing greater stability and efficiency in its rural economic activities and expanding productive employment opportunities.

Target Population

5.34 According to the federal decree which created the program, the Sertanejo program operates in areas where annual rainfall is low (less than 800 mm) and irregularly distributed and where there is a high incidence of droughts. 1/ In the Northeast as a whole, this involves an area of 874,000 square kilometers, or 52% of the region's territory, which contains about 40% of its total population. More specifically, this area involves the semi-arid portions of all the northeastern states (except Maranhão) plus northern Minas Gerais, and thus, overlaps with the region where DNOCS operates.

5.35 Within these areas, the target population for the program is divided into four groups: (a) rural producers without their own land, including tenant farmers, sharecroppers and squatters as well as salaried workers; (b) small owner operators with less than 100 ha; (c) medium-sized owner operators having between 100 and 500 ha insofar as they present the possibility of improving their lands by making them more resistant to the drought and by increasing their utilization of labor; and (d) landowners having more than 500 ha whose projects are approved by INCRA and SUDENE and who provide access to land for laborers and smallholders in groups (a) and (b). It should be observed that this target population not only includes that of POLONORDESTE (groups [a] and [b] in the areas where this program operates), but potentially includes virtually the entire population engaged in farming and ranching activities in the semi-arid Northeast.

1/ Sertanejo nuclei are identified on Map No. 15688.

Instruments

5.36 The Sertanejo strategy revolves around "nuclei", which consist of one or more municipalities and have a flexible radius of 30 kilometers around a municipal seat of microregional importance. Several distinct lines of action are to be taken in each project: the formation of water reserves; the intensification of irrigated output; more rational water use; stimulus to dry farming; intensification of cattle production; soil improvement and conservation; land tenure reorganization; technical assistance; credit; and marketing and cooperative services. To date, the main support activities pursued under Sertanejo include the provision of short-term and investment credit, together with extension services and the construction of small reservoirs, dams, and wells on the land of the producers who have received investment credit. Other activities mentioned in early program documents, such as agricultural research and experimentation (to develop production systems for small irrigated areas, for dry farming, and for management of the caatinga), land expropriation and marketing services, have, thus far, remained basically undeveloped.

Administrative Structure

5.37 Sertanejo is coordinated in Brasilia by a group within the Ministry of the Interior and at the regional level by SUDENE through a team located in the Department of Agriculture and Food Supply subordinated to the Special Advisor for Rural Development. At the state level, individual projects are administered either by Agriculture Secretariats, DNOCS or CODEVASF, a system which has resulted in problems due to the limited degree of collaboration among these agencies. The nuclei consist of technical teams, whose basic activities are to prepare short-term and investment credit proposals, to provide technical assistance, and to monitor credit users in the application of their loan funds. According to program guidelines, each nucleus should have an administrative and technical staff of 30, including eight university level professionals, three of which, together with two agricultural technicians, would be supplied by EMATER, the rural extension service.

Results

5.38 The Sertanejo program depends heavily on the availability of the special Sertanejo credit line, extended at 5% interest, since Sertanejo project activities are primarily on-farm improvements (unlike POLONORDESTE, which constructs physical and social infrastructure and also provides support services not located on the production unit as such). Considerable credit resources have been budgeted for Sertanejo -- Cr$5.9 billion in 1980, Cr$15 billion in 1981 in current prices -- though actual applications were considerably less (60% of resources budgeted in 1980, and 50% through August 1981). Funds for the establishment and maintenance of the nuclei were Cr$1.5 billion in 1980/81 and Cr$2.5 billion in 1981/82 (in current prices).

5.39 As of the end of 1981, 76 specific geographic areas had been designated as "nuclei", for project intervention with another 31 at the planning stage. DNOCS or state governments (generally through their agriculture secretariats) were responsible for almost all of the projects in operation, but CODEVASF had at least one. There is a high degree of geographical overlap (as well as the coincidence of target populations and project components) between Sertanejo and POLONORDESTE. Many of the sites selected for Sertanejo nuclei are also POLONORDESTE areas (as well as DNOCS or CODEVASF project locations). 1/

5.40 The existing projects are distributed throughout the nine states. They are situated mainly, but not exclusively, in the drier parts of the interior. The initial set of nuclei were placed in existing DNOCS irrigation districts located in river valleys. Subsequently, sites were broadened to include other areas under state government responsibility, and political pressures have resulted in the location of several nuclei in areas having annual rainfall levels above 800 mm.

5.41 In quantitative terms, Sertanejo results have fallen far short of the original goals, reflecting credit restraints and weak technical and administrative support. A comparison of key targets established at the start of the program with accomplishments by 1980 shows the following:

Indicator	Original Target by 1979	Actual Achievement by April 1980	%
Land irrigated (ha)	84,600	4,560	5.4
Land placed under rainfed crops (ha)	282,000	14,000	5.0
Land placed under pasture (ha)	1,410,000	49,300	3.5
Permanent jobs created	129,900	9,800	7.5

Source: Sertanejo data.

However, the rate of implementation is improving. In 1979, for example, 1837 contracts for new investment projects were written; in 1980, the number rose to 3031 and in 1981, to 5148.

5.42 The program's initial activities do not appear to have been in complete harmony with its intended objectives. In a SUDENE survey of 18 nuclei, for instance, small-holders with less than 100 ha made up 94% of the landowners, but constituted only 56% of Sertanejo beneficiaries. Landless producers have not been included in most program activities. The profile is similar with

1/ In Pernambuco, for example, of the 31 municipalities assisted by the Sertanejo Project, 21 (68%) are in POLONORDESTE areas.

respect to credit extended. As of December 1981, smallholders with less than 100 ha. received 53% of the investment credit, while medium-sized owner operators with 100 to 500 ha. received 47%. Credit made available for land purchase has been negligible: BNB provided only Cr$1 million for land purchase under Sertanejo through 1980, or 0.06% of the volume which it extended for investment credit. By contrast, some 87% of BNB administered Sertanejo credit has gone to livestock development. In short, many of the credit beneficiaries are medium rather than small producers, and many appear to be ranchers rather than farmers.

General Observations

5.43 In general, the Sertanejo project appears to have benefited medium-scale farmers in the 100 to 500 ha category almost as much as small producers. In the original program planning documents, land purchase credit was envisaged for assisting landless and small farmers; yet virtually no such credit has been made available. Another goal was the creation of cooperatives in every nucleus where none previously existed, but this also has not occurred.

5.44 A key reason for the program's low overall accomplishments has been the shortage of credit. As with the experience under POLONORDESTE, the Sertanejo project managers blame lack of interest by the banks for delays in the disbursement of funds and for shortfalls in resource levels needed. The quality of extension services has also been questioned on account of the inexperience and high rate of turnover of EMATER personnel, as has the lack of research and experimentation on appropriate technologies and small farmer production systems for the semi-arid region. The program, in fact, appears to have been pushed forward before clear technical strategies had been thought through.

5.45 With delays in program implementation, the program's staff-beneficiary ratio has been high. In early 1980, some 1,400 extensionists and other personnel were employed in 46 centers to serve some 5,000 farmers and ranchers with credit and technical assistance. Sertanejo staff concede that considerable under-utilized capacity exists. However, the situation is improving. In 1978/79, the ratio of direct government expenses (including administrative expenses) to credit resources released was on the order of 5 to 3. In 1980/81, the ratio was 1 to 2.

5.46 There are also coordination problems among the agencies involved, resulting in conflict at the local level concerning orientation of the extension work. Technicians are contracted by EMATER, but directed by DNOCS, CODEVASF or state governments to carry out objectives and targets set by Sertanejo management at SUDENE. Coordination among the executing agencies is poor and SUDENE has not been able to effectively assume a role of technical coordination. In short, the program appears to have had limited success, thus far, in attaining its declared objectives of expanding employment, increasing and stabilizing small, as well as medium, farmer incomes, and making landless laborers and smallholders more resistant to the drought.

Recommendations

5.47 The Sertanejo program has the potential to make an impact on the drought problem by virtue of the financial resources at its disposal and the distribution of nuclei throughout the semi-arid parts of the Northeast. In order to carry out its mandate, however, more attention should be given to the agronomic and economic potential of the various sub-areas in its jurisdiction as well as to the problems of small farmers. The sertão is a highly diverse area, and the nature and extent of the assistance needed may vary substantially across nuclei. Moreover, the actions of the program should be brought more in line with its original objectives. Actions should include efforts to:

a) Introduce significant land redistribution and titling components, patterned after recent POLONORDESTE projects, so that the landless may acquire their own properties; smallholders whose properties are demonstrably too small to provide a living could increase their size; and producers currently without definitive land documents could obtain greater access to official credit, especially for investment.

b) Expand the water conservation and on-farm irrigation assistance components of Sertanejo, at present given very little emphasis. Investment credit should be available to small farmers so that they can develop water resources (build small dug-outs or irrigation on small areas), where economically justified, to strengthen their properties against climatic hardships.

c) Encourage the use of improved rainfed farming methods in appropriate areas to complement traditional patterns of cultivation and irrigated agriculture. Reforestation efforts in selected semi-arid areas to control erosion and fix moisture should be promoted. Training for extensionists in these innovative techniques would be required.

d) Help organize farmer groups and create and/or strengthen small farmer cooperatives so that they represent smallholders' interests at the nuclei level and help tackle the crucial question of marketing operations.

e) Eliminate the large credit subsidy in favor of greater availability and a more equitable distribution of credit.

f) Improve coordination among executing agencies within the program and between the Sertanejo program and other special programs, especially POLONORDESTE. In many ways, Sertanejo and POLONORDESTE represent a duplication of efforts and administrative structures, and combining compatible aspects of the two programs should also be considered.

D. Water Resource Use Program

5.48 PROHIDRO (or Water Resource Use program), established in September 1979, is one of the most recent special programs for the Northeast. 1/ Operating in the entire semi-arid part of the region (including northern Minas Gerais), it is the result of studies carried out by SUDENE and and the Ministry of the Interior. The program is officially viewed as a complementary instrument to the large-scale irrigation schemes, POLONORDESTE, and the Sertanejo Project, because it focuses on increasing the availability of water to small and medium producers.

Objectives

5.49 Specifically, PROHIDRO has three major declared objectives: to increase water availability for human and animal consumption; to support irrigation efforts; and to strengthen agricultural production units economically. Not surprisingly, these objectives not only complement but, in some cases, actually coincide with those of other special programs.

Instruments

5.50 PROHIDRO uses six basic activities to carry out its objectives:

a) construction of small- and medium-sized public reservoirs for local community water supply;

b) drilling, installation, repair, and maintenance of tube wells in rural communities in order to establish and preserve simplified local water systems;

c) drilling of private wells on rural properties financed by a special credit line;

d) construction of small private reservoirs also financed by a special credit line;

e) regulating water flow (perenização) in northeastern rivers which have large fluctuations in water level, through the construction of dams of various sizes to permit better agricultural use of more humid valleys and plains (várzeas); and

f) acquisition of drilling rigs by state governments in order to increase water supply to communities and rural properties.

1/ Only the program for the sugar cane area (PROCANOR) briefly described above (para. 3.56-3.59) is more recent, having been created in April 1980.

5.51 In 1979, Cr$9.9 billion was requested for the water resource program for the period of March 1979 - March 1982, including Cr$6.4 billion in direct government investments (derived from PIN funds) and Cr$3.5 billion in subsidized rural credit. Of the public investment funds, 55% of the total would be applied toward regulating rivers, 1/ while 86% of the credit funds would be made available for private reservoir construction. Credit would be extended at 7% interest with 12 years 2/ for repayment and a 3 year grace period.

Targets

5.52 Initial targets for the 1979-81 period included 150 public reservoirs, 7,840 community wells, 3,000 private wells, 10,000 private reservoirs and 100 drilling rigs. No quantitative target was specified initially for river flow regulation; subsequently, 25 rivers were targeted for flow regulation. Among the states, projected expenditures for the 1980/81 period were expected to be concentrated largely in Bahia, Ceara, Rio Grande do Norte, Pernambuco and Paraiba, each to receive roughly 14% of total budgeted funds.

Administration

5.53 PROHIDRO activities must be approved by the Ministry of the Interior in Brasilia, while SUDENE is reponsible for coordination at the regional level. The executive agencies for the program include DNOCS and CODEVASF as well as state government institutions. Financial agents for the program are those banks (Bank of Brazil, BNB, etc.) which comprise the national rural credit system.

Results

5.54 Progress in executing the program has been slower than originally anticipated, with only 69% of the funding approved for 1979-80 having been released by the end of that period. In March 1981, however, PROHIDRO was allocated an additional Cr$15.7 billion. Rates of implementation have varied considerably among different program components. Thus, while 75% of the target for the construction of private reservoirs on rural properties (through investment credit) was met, by 1981 only about 25% of the public reservoirs had been built and less than 15% of the projected number of community wells had been installed. Of the 25 riverflow regulation projects, only a few had been started by early 1981.

General Observations

5.55 Many of the actions planned by PROHIDRO represent a continuation of traditional water storage measures which, as indicated earlier, are not likely (on their own) to strengthen the drought resistance of the poorer

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1/ Public reservoirs would receive 22% of total investment funds as compared with 20% for community wells and 3% for drilling rigs.

2/ Ten years in the case of well construction.

farmers. Benefits from reservoirs located on private property are unlikely to be widely shared. While the increase in the volume of stored water will certainly increase domestic supply for towns and rural communities, the effective use of the water for crop irrigation is also needed.

5.56 The most novel feature of the program is the attempt to regulate the flow of some 25 rivers (perenização) as the basis for year-round agricultural production by riverside farmers using simple irrigation techniques. 1/ Despite its innovative nature, it is not clear whether perenização will benefit small farmers most vulnerable to the drought, or whether the major beneficiaries will eventually be medium and larger-scale enterprises. One of the first effects will be to raise the value of riverside lands, as they become attractive investment opportunities with a guaranteed water supply and needed infrastructure. It is reported that small holders in the Pajeu river valley (part of the Asa Branca scheme) are under pressure to sell their land, with only two of the six planned mini-dams completed. This once again demonstrates the need for land ownership to be carefully considered in the planning of development projects. The construction of major dams by DNOCS at the head of these river valleys also carries the risk of social conflict as local inhabitants are displaced.

5.57 Another danger is that of salinization, mentioned earlier (para. 5.26). Without proper technical guidance, large areas could become useless. Successful irrigation demands careful water control and drainage. Therefore, there is a great need for trained extensionists to orient farmers in proper irrigation techniques, something which is lacking at present within the state EMATERs and even DNOCS. This technical assistance, as well as access to inputs and market outlets, is particularly important for poorer farmers with few resources.

Recommendations

5.58 As the program is developed, the importance of its role in providing water-related infrastructure to integrated rural development projects should be kept in mind. While it is still too early to have a firm sense of the impact of the PROHIDRO program, it appears that smallholders may not be the principal beneficiaries of all of the activities. Investment credit is normally only available to those with land titles, while the regulation of water flow, by increasing land values, may tend to make access to irrigable areas by small producers even more precarious than it already is. In any case, more information on program consequences and beneficiaries is needed, and some provision should be made for careful monitoring and evaluation.

1/ Two states have formulated integrated projects for river valley development which incorporate perenização using funds set aside by the PROHIDRO program. Asa Branca (Pernambuco) and Promovale (Ceara) envisage not only the regulation of water flow but also the provision of infrastructure such as roads and electricity, as well as agricultural extension and support services. Asa Branca is to be established in five valleys irrigating a total of 6,500 ha, while Promovale covers the lower-middle Jaguaribe valley and plans to irrigate 12,000 ha.

5.59 River regulation (perenização) has the potential to benefit small farmers by offering regular water supply and irrigation facilities, but complementary measures and safeguards similar to those recommended for Sertanejo are needed. They include the following:

a) Land redistribution along the rivers, for purchase by landless producers or smallholders, and land regularization and titling services for smallholders should be provided in the affected areas.

b) Investment credit should be made available to small farmers to purchase irrigation equipment.

c) Farmers should be helped to organize into strong, representative farmers' groups capable of protecting their interests and dealing with consumer and marketing operations.

d) A comprehensive training program for both extensionists and farmers to acquire the necessary expertise in water usage and conservation techniques should be developed.

E. Semi-Arid Tropics Research Program

Objectives

5.60 The Semi-Arid Tropics Research Program (Trópico Semi-Árido or TSA), was established in November 1974 with the basic objective of investigating methods of agricultural production and resource conservation for the semi-arid interior of the Northeast. Specific research areas include agriculture and livestock development, natural resources (including water), industry, housing and sanitation, alternative energy sources, and studies of disease, malnutrition and demography. With regard to agricultural research, its experiments are directed at establishing production models for small and medium-sized farmers, in cooperation with other special programs such as POLONORDESTE (which partially finances the Semi-Arid Tropics program) and Sertanejo. Of all the programs aimed at benefitting drought-vulnerable farmers, this has the biggest technical potential for subsequent development activities.

5.61 The most relevant research subprogram, which has also received the largest single share (29%) of the projected program budget for 1980-81, is entitled "Water Conservation and Irrigation Systems for Small Properties in the Semi-Arid Interior". 1/ Its principal objective is to stabilize the rural population of small properties in the sertão by doing what traditional anti-drought water storage measures have failed to do. This involves utilizing

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1/ Other subprograms (and their shares in the 1980-81 budget) are desalination (17%), soil use (16%), animal health (11%), new materials (9%), rural education (9%), and pest control (9%).

anti-drought water storage measures have failed to do. This involves utilizing accumulated water through irrigation systems designed to suit particular water and soil characteristics, so that crop production is possible even under adverse climatic conditions. Alternative energy sources such as charcoal-gas fired engines and pumps are being developed in conjunction with these models.

Administration and Funding

5.62 The National Scientific and Technical Research Council (CNPq), in collaboration with SUDENE, has principal responsibility for coordination of the Semi-Arid Tropics Research Program, which also involves the participation of EMBRAPA and several northeastern universities. Since 1976 the major research activities have been funded by PIN (channeled through POLONORDESTE); one of the sub-programs, which includes water conservation and small-scale irrigation, presently receives 77% of its budget from the Inter-American Development Bank (IDB). Domestic funding for 1980 was Cr$190 million.

Results

5.63 There are two basic irrigation models being tested: type A for use with a plentiful water supply, and type B where water is scarce or in temporary supply and soil conditions are poor. Type A is designed specially for rivers whose flow has been regulated and, in fact, PROHIDRO has allocated Cr$ 20 million towards these experiments. Type B, which uses drip-feed irrigation, is suited to the semi-arid interior, where most small farmers have limited water stocks in small wells or catchment tanks. Some 60 irrigation experiments were expected to be in operation by September 1981 as demonstration projects in cooperation with Sertanejo nuclei. The Caico nucleus in Rio Grande do Norte is the most successful example so far of the diffusion of new irrigation techniques, with an estimated 350 ha irrigated on 150 properties, mainly fed by the adjacent flow-regulated river.

5.64 Initial results from the CNPq/SUDENE experiments are promising, and reasonably higher yields have been achieved for corn and beans. 1/ Double or even triple-cropping is possible, and crop combinations are designed to provide the farmer with income the whole year round. These systems therefore appear to have at least the potential to help stabilize employment and improve incomes for salaried workers taken on as extra labor. However, before definite conclusions can be drawn, cost-benefit analyses will be necessary to determine the longer-term economic feasibility in normal conditions without the use of heavily subsidized inputs.

F. Conclusions

5.65 Despite a variety of programs aimed at drought relief and water resource development, little has been accomplished so far to protect small

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1/ Yields for beans and corn have been as high as 1,082 kgs. and 1,030 kgs. compared with normal figures of 400 kgs. and 600 kgs. respectively.

farmers permanently from the periodic droughts. Some of the reasons are political; others reflect the difficulty of working with a group which does not have ready access to modern agricultural techniques, irrigation methods, or credit. Nevertheless, a commitment to the small farmer is likely to help bring about lasting improvements in the region.

5.66 Motivated by the drought, the Government has taken several actions in the past year to improve water resource development in the region. The First National Irrigation Plan, 1982/86, has been submitted by the Minister of the Interior to the President of the Republic. The plan seeks to put the existing irrigation programs under a single planning and control system, with the coordinating office of MINTER setting priorities for allocation of funds and monitoring implementation. SUDENE has also approved a study on water resource use in the region. For the first time, proposals for the use of water resources have been based on an extensive analysis of soils, water availability, and climatic factors. The Northeast has been divided into many homogeneous sub-regions and a set of recommendations for each sub-region has been proposed, to better match the total demand for water with the availability of water. In addition, the Government has decided to extend the Provárzeas Project, a subsidized credit program which finances on-farm irrigation and drainage works, to the Northeast.

5.67 It is not clear what the effect of these actions will be on the small farmer. It is hoped that the suggestions given below for improving the effectiveness of the drought-related special programs in dealing with the small farmer will be incorporated in the implementation of the new plans.

Objectives

5.68 The objectives of the drought-related special programs should be revised where necessary to focus on strengthening the weaker groups of farmers against the effects of drought. MINTER, in consultation with SUDENE, should assume responsibility for this task, with the ultimate objective of obtaining overall consistency in goals and strategies among the anti-drought programs in favor of longer term developments. At present, there is no such general agreement and the programs, conceived independently of each other, are currently executed with little coordination among them.

Coordination

5.69 The emergency drought relief and water resource programs are so complementary to the rural development program that they should be closely coordinated. It is difficult to increase the productive capacity of small producers without addressing the issue of their access to water. Similarly, the water resource programs, if divorced from organized assistance with seeds, cultivation techniques, and basic water use methods, cannot be expected to help the small farmer significantly.

Land Issues

5.70 Land redistribution and titling are necessary prerequisites for the drought-related programs as well as for POLONORDESTE. Without secure land tenure, if not actual title to the land, credit is almost impossible to get and small

producers are not as interested or willing to take advantage of other agricultural assistance provided under the special programs. Some small farmers who already own their land may also need to increase the size of their holdings to reach an economically viable size. When substantial infrastructure investments are put into place without adequate prior treatment of land-related issues, the likelihood of later channeling a reasonably share of the benefits to small producers is not high.

On-Farm Water Use

5.71 Simple, on-farm irrigation improvements appear to hold great promise for increasing the productivity of small producers and for insulating them from the periodic droughts. The TSA program experiments have shown that it is technically feasible to use irrigated production, combined perhaps with some cattle and/or rainfed farming in areas of limited water supply and poor soils. While cost-benefit studies have yet to be made of their longer term economic feasibility, it is clear that policy changes are necessary before small-scale irrigation can be widely adopted in the Northeast:

a) Most of the existing traditional irrigation models are relatively expensive and often require capital investment well beyond the reach of most small and medium farmers, especially for use of the more sophisticated drop methods. Therefore, long-term credit would have to be made available for irrigation investments to smaller producers who are not accustomed to receiving official credit.

b) Constant supervision and technical assistance from agronomists adequately trained in small-scale irrigation methods are also essential, given the novelty and complexity of the new practices.

c) Realistic studies to determine the long-term economic feasibility of irrigated small-scale production, including alternative systems appropriate for irrigated areas of different sizes, selection of crops and efficient cultivation methods at the farm or the community level, and market outlets will also be needed.

5.72 Even small-scale irrigation systems require some central infrastructure investments for capturing or storing water. In most cases, some government funding will be needed to cover these costs. If broader promotion of these simple irrigation systems is to be adopted by several special programs, coordination -- perhaps through a permanent irrigation center within MINTER, responsible for coordinating and guiding efforts in irrigation -- will also be needed.

5.73 In the meantime, simple on-farm methods of utilizing existing water can be used more extensively than they are now. Installation of small community dams (where the land tenure pattern permits) to serve 5-10 farms, pumping water from rivers and wells to the fields, and improved rainfed farming techniques are already being used to some extent. If planned correctly, these methods can be effective at a relatively low cost. Moreover, unlike large irrigation systems, they do not require as much organization and often can be used without having to resolve as many of the difficult issues of land ownership and water rights. However, they, too, require credit for purchasing equipment and extension programs to disseminate basic information on water requirements, control, and drainage, as well as efficient means of marketing output.

Reforestation

5.74 While the drought problem is normally confined to the sertão, recently large areas of the agreste have also been affected, due at least in part to progressive deforestation. These moderately dry areas are in urgent need of an active reforestation program to reverse the process. Trees such as the algarobo are known to be drought resistant and can control erosion, mobilize nutrients in the soil, and retain moisture. The leaves can be used as cattle fodder. Demonstration farms could be located in several parts of the Northeast, under guidelines set by the Institute of Forestry Development (IBDF), to grow trees and produce seedlings for farmers. Experience in Minas Gerais has shown that once the demonstration effect takes hold, small farmers demand large quantities of seedlings. Trees grown in the proper areas can provide security for smallholders in some ways similar to cattle, as they can be harvested as needed and the right varieties are drought resistant.

Program Management

5.75 Program management for the drought-related special programs needs to be revised and strengthened at all levels, especially if the programs are to function in a coordinated fashion. Policy formulation (setting the objectives and general approach), programming (design of intervention strategies, procedures, and monitoring systems) and execution (technical and managerial direction of the work) should all be upgraded.

5.76 At the SUDENE level, stronger management for each of the special programs is needed to plan, monitor and evaluate progress in executing anti-drought measures within the general policy guidelines. For example, SUDENE has total planning responsibility for drought relief through its disasters office, but the management structure for this formidable task is, in fact, very thin. Given the day-to-day preoccupations with providing immediate emergency aid, this office has insufficient time and resources to take a longer-term, more structural view of the whole drought question. Relief measures should be integrated into an overall plan for more rational water utilization in the interior and the strengthening of drought-vulnerable agriculture.

5.77 At the SUDENE level, greater technical expertise should be made available to help program the type and size of wells, retention structures, etc., which would be appropriate anti-drought investments in different areas of the sertão. SUDENE and the respective states would need additional financial and technical resources to adapt drought-relief measures to the longer term needs and local reality of each microregion. At the state level, coordinating and developing the management capability for water resource planning and anti-drought activities are equally important. The states should develop expertise in this area, undertake river basin studies where appropriate, provide managers to implement or oversee the implementation of the water components of the special programs, and supervise the siting, design and construction of water retainment facilities.

Information Systems

5.78 Adequate monitoring and evaluation systems need to be set up in order to document accomplishments and identify problems early enough to modify aspects of the program as needed. PROHIDRO, for example, was conceived and approved within a very short space of time, and little consideration appears to have been given to matters such as evaluation of the program's impact or provision made for staff to carry out this task. An information system for Sertanejo is also needed.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.01 The socio-economic situation of the rural Northeast appears to have improved somewhat over the past decade. However, wide intra- and interregional disparities persist. And, despite long-standing policies to the contrary, the production of basic food crops has stagnated, the structure of land ownership remains highly concentrated and the rural population continues to leave the countryside for the region's cities or the South. Even the effects of the drought, which have been subject to concerted public action since the nineteenth century, have not, as the experience of 1979-81 has shown, been appreciably limited.

6.02 The Government's response to the persistent problems of the Northeast has covered numerous approaches. These have ranged from massive and small-scale dam building and large irrigation programs, to fiscal and financial incentives for industrialization (including agro-industry), to land settlement schemes, small farmer extension, rural social services, and emergency drought relief measures. Some of these programs have been hastily conceived, others imperfectly executed, and in certain cases the funding levels and continuity of effort have been inappropriate. Nevertheless, it is clear that the Brazilian Government has sought in recent years to attack "the Northeast problem" across quite a broad front.

6.03 Yet the fact that much still needs to be accomplished highlights the deep-seated origins of certain problems and their relative intractability. The inhospitable climate and relatively poor soil conditions in the semi-arid interior, the low level of water resources development, the bottling up of cultivable land on large, underutilized holdings, and the lack of alternative employment opportunities in the countryside are not obstacles which are easily removed. Widespread poverty, low rates of literacy and primary school attendence, and health problems must also be dealt with.

6.04 At the same time, the level of government spending in the Northeast is modest and the timeliness and continuity in funding very uneven. Normal federal budgetary expenditures, which account for the vast bulk of public spending, are low in the Northeast region: 36% of the national per capita average (for federal spending) in 1975. When the federal budget is combined with the state and municipal budgets in the Northeast, the combined government effort is equivalent to only 31% of the corresponding figure for all Brazil in per capita terms. All the Northeast special programs add only a tiny fraction toward closing this gap (some 3% of the gap, as defined in para. 3.08).

6.05 Even if government intervention alone were capable of "solving" the problems of the Northeast, then, the modest scale of the effort now being undertaken so far scarcely can be expected to reverse the situation. Moreover, direct public efforts to help the rural population have been made more complicated by on-going national policies, such as alcohol production from sugar and subsidized agricultural credit, which have had unintended, negative effects on small owner-operators and landless farmers.

A. Special Programs

Results of Special Programs

6.06 What, then, have been the results of the special programs carried out specifically to address the Northeast's problems? First, the absence of evaluation data at this stage makes it impossible to answer this question with certainty. Several of these programs, created in the mid-1970s, have scarcely had enough time to be adequately assessed, especially in light of the 1976 and 1979-81 droughts. However, some impressionistic views may be ventured.

6.07 POLONORDESTE appears, thus far, to have had mixed success in increasing productivity of the small farmer. Extension, electricity distribution, school, and road construction targets are being met to a large extent, while provision of assistance to cooperatives and marketing, construction and maintenance of health posts, and land-titling and purchase/redistribution activities have been much more difficult to accomplish. In terms of the achievement of program objectives (to increase agricultural output and productivity, expand employment, and improve rural incomes and living conditions), the lack of evaluation data makes strong conclusions at this point premature. However, POLONORDESTE's philosophical posture -- to assist small (and even landless) farmers in selected areas of good agricultural potential with an integrated development approach -- seems a sensible balance of efficiency and equity goals. The emphasis on extension, moreover, reflects the program's concern with declining crop yields (see paras. 2.21-2.23) in the region. A program as complex as POLONORDESTE needs time to mature. The accumulated experience of the executing agencies is visible in the improved targeting of activities, coordination, and service delivery of recent years. POLONORDESTE is also beginning to address the land issue through purchase and redistribution, land regularization, and titling services, and is giving more attention to water resource development and use techniques appropriate to the small producer, aspects which have been neglected in the past.

6.08 In contrast to POLONORDESTE, the Sertanejo Project, designed to strengthen small and medium farmers against drought conditions in the semi-arid region, has generally achieved only a small percentage of original targets. Shortage of credit has hampered progress; much of the credit available has gone to medium and large farmers, and a large amount has been for livestock development rather than crop farming. Landless and small farmers have not been effectively reached. Sertanejo has, however, worked with some promising small-scale irrigation and water conservation experiments, with intentions to promote these activities more broadly in dry areas in the future.

6.09 Water resource programs, such as large-scale irrigation by DNOCS and CODEVASF and, now, the PROHIDRO effort, have achieved much more in engineering than in economic and social terms. The traditional approach of creating massive water storage capability in the Northeast, without adequate irrigation systems and often little thought to land distribution, is being reevaluated by the Government. These programs have generally provided water supply for human and animal consumption, but not for agricultural use. Relatively few small farmers have been assisted as a rule. The newest program, PROHIDRO, could make a stronger impact, but only if its activities are closely linked to other rural development activities and if land distribution is closely watched to ensure a reasonably equitable spread of benefits.

6.10 Emergency Drought Relief has more or less successfully met the immediate challenge of providing work and food for millions of rural northeasterners hurt by the drought over the past three years. But funds have usually not been devoted to improvements which are of longer-term benefit in combatting the drought. Instead, large sums have gone into subsidizing fencing and land-clearing operations which mainly benefit large farmers, not those small farmers most vulnerable to the drought. Many small reservoirs were subsequently washed away by floods due to inadequate design, siting, and technical supervision. In short, the tremendous sums spent or lent at low interest could well have been better utilized with more planning and longer-term goals.

6.11 Sectoral social programs have also been instituted in the Northeast, particularly in the basic health and primary education fields. Based to some extent on experience gained under POLONORDESTE projects, the PIASS program is bringing health posts to the countryside, while PRONASEC and EDURURAL/NE are building rural primary classrooms, training teachers, and raising educational quality. These efforts have improved rural living conditions to some extent, but are marred by administrative and recurrent cost financing problems. Because the financial responsibility for paying salaries and operating costs often rests on poor municipalities lacking an adequate revenue base and because user groups are usually poorly organized themselves, the facilities constructed are not always fully utilized or reasonably maintained.

6.12 Programs for the sugarcane zone are very recent and have, as yet, been given little real weight in terms of resources. This seems to reflect the perceived difficulty of improving the lot of small and landless farmers in an area economically and politically dominated by large sugar planters and refiners.

Recommended Modifications of Special Programs

6.13 Each of the special programs can be improved in ways which would increase its capability to meet its objectives.

6.14 POLONORDESTE, with its small farmer orientation and integrated approach, should continue to be supported. Program momentum is strong. The concept of integrated planning is accepted, enough experience has accumulated to improve implementation of the components, and budgeted funds are reaching projects in a more timely manner. The program would be more effective, however, if the number of project areas were reduced and were more sharply focused on areas with agricultural potential; if the number of components were limited to those most clearly needed in the local circumstances and workable within institutional constraints; and if program management were further decentralized and simplified. Much more attention should be given to small farmer access to land and water, which have been serious constraints. In addition, under present financing constraints, intensive assistance to a smaller number of PDRIs would seem to be more effective than spreading limited resources over such a large number of projects and aggregate area.

6.15 The Sertanejo Program should be seriously modified or perhaps even discontinued as a separate program since it has yielded relatively low economic benefits in relation to costs to date. The possibility of better complementarity between Sertanejo and POLONORDESTE or adaptation of certain aspects of the POLONORDESTE approach to the Sertanejo nuclei should be seriously considered by the Government. The Bank is now funding a water resource study as part of the Ruralnorte project; the study will investigate how the POLONORDESTE and Sertanejo approaches might be combined in two Sertanejo nuclei.

6.16 The mission favors a much closer link between the water resource use programs that have some promise - particularly some of the CODEVASF and PROHIDRO projects - and the philosophy and approach espoused by integrated rural development efforts. Again, the possible fusion of, or at least strengthened coordination between, water resource and integrated development programs in their areas of common jurisdiction merits serious consideration. In any event, the necessity to consider land distribution and support service questions when planning water development must be given greater emphasis.

6.17 The Emergency Drought Relief program would benefit from improved contingency planning and linkage with other special programs. The types of investments suitable to various areas could be worked out in advance, thus limiting grants and administered credit to useful anti-drought infrastructure. Alternatively, POLONORDESTE projects could have a standby component for emergency drought activities which would be activated during periods of drought. Plans prepared for other water resource programs should be integrated with drought relief activities, thus using the available manpower for dual purposes.

6.18 Programs in the social sectors deserve increased support as a way of improving the region's human/capital. For instance, EDURURAL/NE, the Northeast Basic Education project, is only operating in about one-fifth of the Northeast municipalities; it should eventually be expanded to cover the whole region. The sectoral approach could be adopted in other fields as well, especially when experience under area-based integrated rural development projects suggests key global issues which need to be addressed on a region-wide basis.

6.19 Poverty alleviation in the sugarcane zone has not received as much attention as it deserves. The Government should consider more substantial rural development and social service efforts in the zone than are presently being undertaken by the PROCANOR program. This zone suffers from serious social problems, in part because of the expansion of sugar production on land formerly used by tenant farmers for subsistence crops and the legal obligation of landowners to pay permanent employees the minimum wage and other benefits.

Administrative Structure

6.20 Within the individual programs, there is a strong need to strengthen planning, management (including coordination), and monitoring and evaluation capabilities both at the state and regional levels and to simplify administrative procedures. All of the special programs require the cooperation of several

agencies. Therefore, the ability to redirect agency operations and train agency staff to deal with the objectives of the special programs is critical to the success of these programs. Similarly, the multi-agency nature of the programs make program evaluation not only essential but also more complicated to undertake. Thus far, only POLONORDESTE is taking serious steps to collect statistically valid evaluation data. While these efforts should be strengthened, the other special programs also need to collect baseline information as well as to establish procedures to study program impacts.

Financial Control over Special Programs

6.21 The mission's work has revealed that knowledge of and control over expenditures could be improved. First of all, data were not available to the mission giving the actual level of spending for the various special programs. Secondly, many of the executing agencies do not exercise unit cost control, largely because of lack of training and the complications of high inflation levels. Thirdly, the use of PIN/PROTERRA funds links the resources available for Northeast rural development directly to the level of industrial activity in the country, not just to activity in the region. There is no logical reason for this; supplementing PIN/PROTERRA funds with regular budgetary resources would be a better way to meet the planned needs of the special programs and to express the commitment of the federal government to helping the rural Northeast.

B. Role of SUDENE

6.22 No discussion of Government intervention in the rural Northeast is complete without considering the past and future role of SUDENE. The organization played a powerful political role in the early 1960s, and was established to fulfill the need for technical guidance for a number of development activities in the Northeast states at that time. It is apparent that some regional institution is needed to administer the fiscal incentive programs and the special programs. However, the influence, competence, and perhaps relevance of SUDENE has diminished considerably during the past decade. It cannot be assumed that the agency, as presently organized, is necessarily the most effective vehicle for program management.

6.23 In August of 1979, at the request of the Government of Brazil,the Bank submitted suggestions to the Government regarding means for strengthening SUDENE's ability to handle rural development programs. Besides a proposed internal reorganization, a major component of this proposal was that increased managerial ability would require political support to decentralize policy-making to the level, so that instead of being a third level juxtaposed between Brasilia and the states, it would in fact constitute the federal level. The other key requirement was higher salaries, enabling the attraction of a cadre of key technicians who could provide planning leadership and technical and managerial assistance to the states in their execution of these programs.

6.24 Two years later, the internal reorganization of SUDENE has not been approved by the federal civil service commission, though it has been carried out de facto. The Ministry of Interior and especially SEPLAN have retained operational and financial control over the special programs in Brasilia,

while the states have progressively become more and more competent in managing the various programs themselves. Meanwhile, SUDENE has suffered a major salary squeeze which has caused the departure of some of the more specialized members of staffs such as those of POLONORDESTE.

6.25 These developments have convinced the mission that the Government should explore alternative arrangements for managing the special programs. If SUDENE continues to be responsible for the overall management, the organization should be strengthened through political support, technical assistance, and higher salaries for staff. Otherwise, consideration should be given to shifting the management responsibility to other agencies. For example, rural development programs could be administered by SEPLAN/IPEA directly to the states, while water programs could be administered directly by the Ministry of Interior. A small staff in SUDENE could handle the fiscal incentives program.

6.26 With either option, rural development, drought relief, and water programs need to be more closely coordinated to obtain more coherent actions in the field. While the mission has not formed a definite view on the best solution, it does believe that SUDENE's role and the various options need to be assesed promptly, and appropriate action taken to enhance the effectiveness of Northeast programs, since large amounts of resources are being put into the programs with moderate achievement of targets, at best. The reforms envisioned earlier have not been implemented, and, in some respects, the situation may have deteriorated.

C. Toward a Regional Strategy

6.27 Little real integration currently exists among (and frequently within) the various rural development and water resource programs in the Northeast despite their often common or complementary objectives, guidelines, instruments, target populations, and, in many instances, geographic areas of operation. Moreover, it appears that the special programs for the Northeast are not at present well integrated into broader planning efforts at the state (although the Piauí project and Projeto Ceará POLONORDESTE exercises are possible exceptions) and regional levels. Although this report does not focus on this aspect, even less coordination has occurred between rural and urban development efforts in the Northeast. Yet the rural and urban sectors are intimately related. Poor prospects in rural areas in the region have stimulated rural-to-urban migration. If present economic trends continue, rural migrants will continue to seek employment and the "good life in urban areas", and unresolved problems in the countryside will ultimately be transferred to the cities.1/ As the Furtado Report concluded, there is no purely agricultural solution to the problems of the Northeast -- or, indeed, the problems of the rural Northeast.

1/ For example, migration to São Luis, Maranhão, has been a key factor in the priority given by the state to the new Maranhão rural development project.

6.28 While rural development projects as presently constituted can probably contribute to slowing down this rural-to-urban migration, the relatively small population reached so far by these projects and the difficulties encountered so far in improving access to land suggest that this contribution can only be limited. In addition, the rural development programs are developed in isolation from the urban-oriented programs, and they have tended to neglect non-agricultural activities in rural areas. In short, rural-urban linkages and the spatial aspects of area based development (often including rural land use) need to be given much more consideration in special program planning.

6.29 What is desirable, therefore, would be a more comprehensive approach to development - both rural and urban - as part of state and regionwide planning efforts in the Northeast. At the rural level, this would require greater integration among the various rural development programs or, perhaps, their fusion into a smaller number of complementary special programs. Initially, integration might take the form of a broader sectoral approach to project design within the POLONORDESTE context, and greater attention given to the integration of special programs operating in the same geographic areas. Ultimately, development of a more comprehensive strategy would require a clear identification of Government objectives for the region, a sharper matching of programs with objectives, and a good understanding of the development potential of the various sub-regions of the Northeast. 1/

6.30 In addition, a greater recognition of the interdependence between rural and urban development strategies is needed. Encouraging industries which use local inputs and which are relatively labor-intensive -- for example, those which process agricultural products for export -- would make use of the region's resources and provide a more diversified economic base for the region. Furthermore, the location of these activities in towns and small cities, where economically feasible, would link the rural and urban economies more closely. Industrial credit and FINOR funds could also be used more effectively to stimulate use of regional resources, with firms using labor and inputs from the region given higher priority in allocation decisions.

6.31 The transition from a rural to an urban society is to a certain extent inevitable, and rural development policies cannot be expected to halt entirely this historical trend. However, a number of actions can be taken to minimize the possible negative effects of this transition on both the rural and urban populations. First of all, priority should be given to increasing the productivity of northeastern agriculture, especially that of basic food crops, in order to insure adequate food production at reasonable prices. Such efforts would be especially important at this juncture, as livestock and sugar increasingly compete with food crops for the available land. To help assure the sustainability of production and to maximize the

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1/ Existing plans provide a good starting point. See, for example, SUDENE, Proposta de Plano de Desenvolvimento do Nordeste (1980-85), 1979; SUDENE, Elementos para Definição de Uma Política Social para o Nordeste, June 1981 (preliminary); and MINTER, Ação Coordenada de Desenvolvimento (1980-85), Vol. I-III.

return of investments directed to increasing productivity, Government interventions, like those of POLONORDESTE, should to the extent possible be concentrated in areas with reasonably good agricultural potential. Present efforts to improve access to land should be accelerated and expanded and carefully coupled with the provision of essential agricultural support services.

6.32 At the same time, the potential for expanding small-scale enterprises in towns in the country side should not be overlooked. The limited experience to date from the Bank's POLONORDESTE and medium-size cities projects suggests that there is a viable role for public assistance in this area. While these enterprises cannot be expected to make more than a modest contribution to rural development, they can complement agricultural growth, provide some jobs, and perhaps increase consumer choice in the countryside.

6.33 Finally, rural-to-urban migration should be viewed as a positive factor in the region's development rather than an obstacle. The rural population residing in areas of limited agricultural aptitudes should be provided with vastly improved social services. Since this is the segment of the population most likely to emigrate, imparting good health and basic skills will help stimulate social mobility, increase their potential productivity wherever they eventually reside, and generally ease the transition to the urban environment. On the urban side, more thought should be given to generating more employment opportunities for relatively unskilled labor both in small and large enterprises.

6.34 The most likely results of such a set of policies would be: increases in both agricultural and industrial production, employment and incomes and perhaps a decline in rural-to-urban migration. Though history has shown these policies to be difficult to implement in the Northeast, the future returns from them could well be very high.

D. Further Research

6.35 Several problems uncovered by the mission deserve further analysis beyond the scope of this report. These topics should be of mutual interest to the Government and the Bank, and appropriate forms of collaboration could be explored to study them in more detail and to modify present programs accordingly.

Land

6.36 Lack of secure access to land remains probably the major alterable constraint to rural development in the Northeast today. It has not been adequately addressed so far, and the local capacity to execute programs in this field is still weak. In addition, the results of different types of land distribution activities are poorly documented. A thorough stock-taking and monitoring of the practical problems and results obtained in various land activities already underway in POLONORDESTE projects are needed. An analysis of land law and its enforcement in Brazil and the procedures prescribed for expropriation, discrimination, and titling have already been done as part of

the preparation of the Bank's recent rural development projects. Data could be gathered on the difficulties encountered in purchasing land, surveying and discriminating, redistributing and financing land, and producing titles. Evidence could also be sought showing changes resulting from granting secure tenure to a farmer: changes in land and labor use (intensity, crops), alterations in farmer income levels and risk, perceptions of social status and living conditions. The monitoring of the recently initiated Piauí and Maranhão rural development projects, which present several major examples of new land regularization and redistribution efforts, would be added to the evaluations of previous efforts. Such a study could provide important guidance as to which actions in the land tenure area are most beneficial, what the expected gains to society might be, and the kind of assistance which should accompany the provision or purchase of land.

Studies of Agricultural Potential

6.37 A systematic consolidation, completion, and review of studies of agricultural potential in the Northeast is required, particularly in the semi-arid region, covering the distribution of soil types and water resources. This fresh look would help planners to concentrate on those areas which are most suitable for innovative investments. The recognized areas of generally greater potential are the humid areas with better quality soils, such as river valleys, and around the edges of reservoirs, where physical conditions are more favorable and installation costs correspondingly lower. A number of specific studies already exist, and should be better used to exploit the limited agricultural potential of the semi-arid interior. After all, the sertão is a region of diverse climate, topography and soils.

QUESTIONNAIRE

Project Design

1. When was the project design stage initiated?

2. What was your involvement in the design stage of the project?

3. How did the idea for the project arise? What were the principal organizations involved in the initial planning stage? At what organizational level were they involved?

4. How was the planning stage organized?

   4.a. Who headed the planning team?

   4.b. Was it under the direction of the Minister of Planning or the Minister of Agriculture?

   4.c. What were the backgrounds of the members of the planning team?

   4.d. Who furnished the funds to pay the planning team?

   4.e. What was the nature of participation, if any, of SUDENE, the World Bank, or other agencies?

5. What was the original objective of the project?

6. What was the strategy adopted to achieve the original objective?

7. Was a target group defined as the principal beneficiary of the project? If so, what were the criteria used to define this group?

8. In your opinion, what were the principal components of the project?

9. Were some of the components unnecessary? Why?

10. Were any important components omitted? If so, why?

11. How was the coordination of this project with other on-going Special Programs in the same region planned?

12. Did you hope that the project would resolve the principal problems of rural development in the project area?

13. In retrospect, what errors, if any, were committed in the project design? How could the project design have been improved?

Project Execution

14. When was the execution of the project initiated?

15. What problems were encountered in the initial phase of project execution?

16. How was the project organized?

    16.a. Who is the immediate superior of the director or coordinator of the project?

    16.b. How is the technical unit organized? (Attach an organizational chart if possible.)

    16.c. How are the field teams organized?

    16.d. What are the methods used to assure good communication between the field team and the head of the technical unit?

    16.e. How does the technical unit coordinate the activities of the agencies responsible for the execution of the project?

17. Which components of the project have been most difficult to execute, and why?

18. Which components have had the most success in reaching the target group? What are the reasons for this success?

19. Were individuals outside of the project's target group also beneficiaries of the project? If so, was this the intention of the project?

20. How was the integration of the various components of the project achieved?

21. Were any institutional problems encountered in the execution of components involving small farmers? What were these problems?

22. Were the social components well integrated into the project? Have they received adequate administrative and operational support?

23. In practice, how has the coordination been between this project and the other Special Programs?

24. What has been your experience with the transfer of funds?

    24.a. Have the required sums been received in a timely manner?

    24.b. Are the budgetary and funding procedures adequate? Have there been any recent changes in these procedures?

    24.c. Has there been any recent alteration in the timing of the disbursement of funds?

24.d. Are there any specific bottlenecks in the system by which funds are transferred? How could these be eliminated?

24.e. Under what circumstances would a rotating fund be of use?

25. What is your opinion of the annual systems of planning and budgeting (Annual Operating Plans)?

26. What is your opinion of the amount of technical assistance provided by SUDENE, the World Bank, or by other organizations? In what areas is more technical assistance necessary?

27. What other problems or observations would you like to emphasize concerning project execution?

Impact of the Project

28. How is the project's monitoring and evaluation system organized?

29. What data on the impact of the project have been obtained by the monitoring and evaluation system?

30. How have the data been applied in the execution of the project?

31. What improvements could be made in the monitoring and evaluation system?

32. What has been the impact of the project in the project area? (In the absence of quantitative data, please give your qualitative appraisal of the situation.)

32.a. How has the income of the small farmers been affected?

32.b. What has been the impact of the project on landless farmers?

32.c. What have been the benefits received by people outside of the target group?

32.d. What other changes have occurred in the project area as a result of the project?

General

33. What are the principal problems affecting the project area?

34. What success has the project had in resolving these problems?

35. What recommendations would you make in order to solve these problems?

36. How, specifically, could the project be altered in order to make it more efficient?

Please add any additional comments on your project, World Bank and government programs, and/or the problems of rural development.

IBRD 16017
OCTOBER 1981

BRAZIL
NORTHEAST REGION

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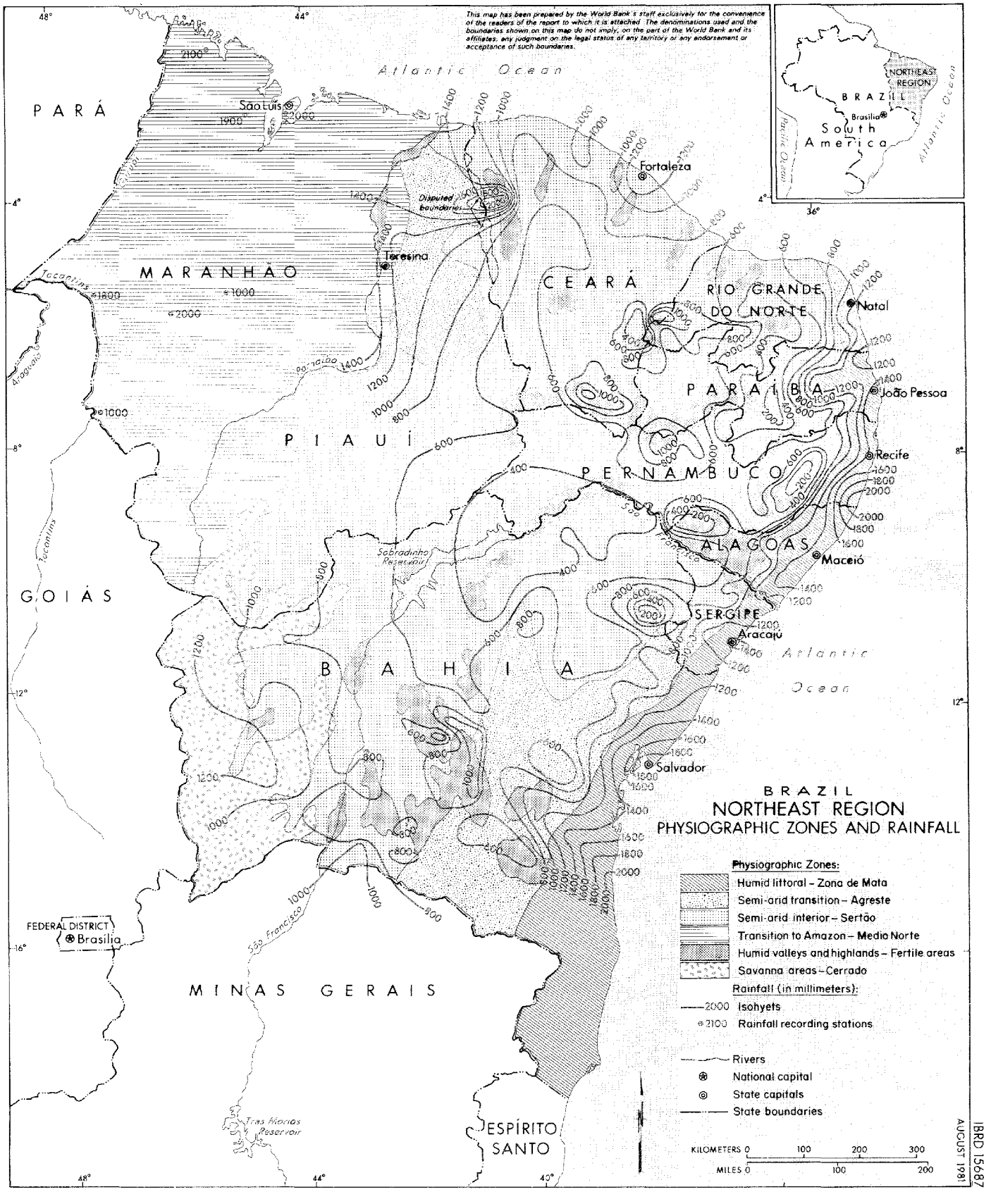
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Atlantic Ocean
PARÁ
São Luís
MARANHÃO
Disputed boundaries
Teresina
Tocantins
Araguaia
CEARÁ
Fortaleza
RIO GRANDE DO NORTE
Natal
PARAÍBA
João Pessoa
PIAUÍ
PERNAMBUCO
Recife
ALAGOAS
Maceió
Sobradinho Reservoir
São Francisco
GOIÁS
SERGIPE
Aracaju
BAHIA
Salvador
Atlantic Ocean
FEDERAL DISTRICT
Brasília
MINAS GERAIS
Três Marias Reservoir
ESPÍRITO SANTO
NORTHEAST REGION
BRAZIL
Brasília
South America
Pacific Ocean
Atlantic Ocean
BRAZIL
NORTHEAST REGION
PHYSIOGRAPHIC ZONES AND RAINFALL
Physiographic Zones:
Humid littoral – Zona de Mata
Semi-arid transition – Agreste
Semi-arid interior – Sertão
Transition to Amazon – Medio Norte
Humid valleys and highlands – Fertile areas
Savanna areas – Cerrado
Rainfall (in millimeters):
2000 Isohyets
2100 Rainfall recording stations
Rivers
National capital
State capitals
State boundaries
KILOMETERS 0 100 200 300
MILES 0 100 200
IBRD 15687
AUGUST 1981


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Atlantic Ocean
PARÁ
BAIXADA OCIDENTAL MARANHENSE
COLONIZAÇÃO
SÃO LUÍS
Gurupi
Sobral
FORTALEZA
Piracuruca
Disputed boundaries
Ipu
S. Quiteria
Canindé
CEARÁ
RIO GRANDE DO NORTE
TERESINA
Crateús
Boa Viagem
Mossoró
Independencia
João Câmara
Açu
Angicos
NATAL
São Miguel do Tapuio
Sen. Pompeu
Jaguaribe
Caraúbas
Santana do Matos
MARANHÃO
Taua
Pau dos Ferros
Sta. Cruz
Pimenteiras
Iguatú
Icó
Acarí
Caicó
Picuí
Valença do Piauí
Souza
Pombal
S. Luzia
PARAÍBA
JOÃO PESSOA
Oeiras
Picos
Fronteiras
Cajazeiras
Soledade
Araguaia
Parnaíba
Jaicós
Taperoa
Serra Branca
Pianco
Conceição
Sumé
PIAUÍ
Araripina
Ouricuri
Afogados de Ingazeira
Simplicio Mendes
Salgueiro
Serra Talhada
Custodia
RECIFE
Paulistana
Parnamirim
PERNAMBUCO
São João do Piauí
Afranio
Floresta
Ibimirim
S. Maria da Boa Vista
São Raimundo Nonato
Santana do Ipanema
Delmiro Gouveia
Palmeira dos Indios
Tocantins
Sobradinho Reservoir
Uauá
Poço Redondo
MACEIÓ
ALAGOAS
Jeremoabo
N.S. da Glória
Euclides da Cunha
Itiuba
Poço Verde
Cipó
ARACAJU
SERGIPE
Irecê
São Francisco
Atlantic Ocean
Paraguaçu
Jaguara
BAHIA
SALVADOR
GOIÁS
Livramento do Brumado
Brumado
Guanambi
Condeuba
Gorotuba
F.D.
BRASILIA
MINAS GERAIS
ESPÍRITO SANTO
BRAZIL
NORTHEAST REGION
Brasília
South America
Pacific Ocean
Atlantic Ocean
BRAZIL
NORTHEAST REGION
SPECIAL PROGRAMS
Locations of Project Areas
Polonordeste Projects With World Bank Financing
Other Polonordeste Project Areas
Sertanejo Project Nuclei
Rivers
National Capital
State Capitals
Selected Towns
State Boundaries
KILOMETERS 0 100 200 300
MILES 0 100 200
AUGUST 1981
IBRD 15688