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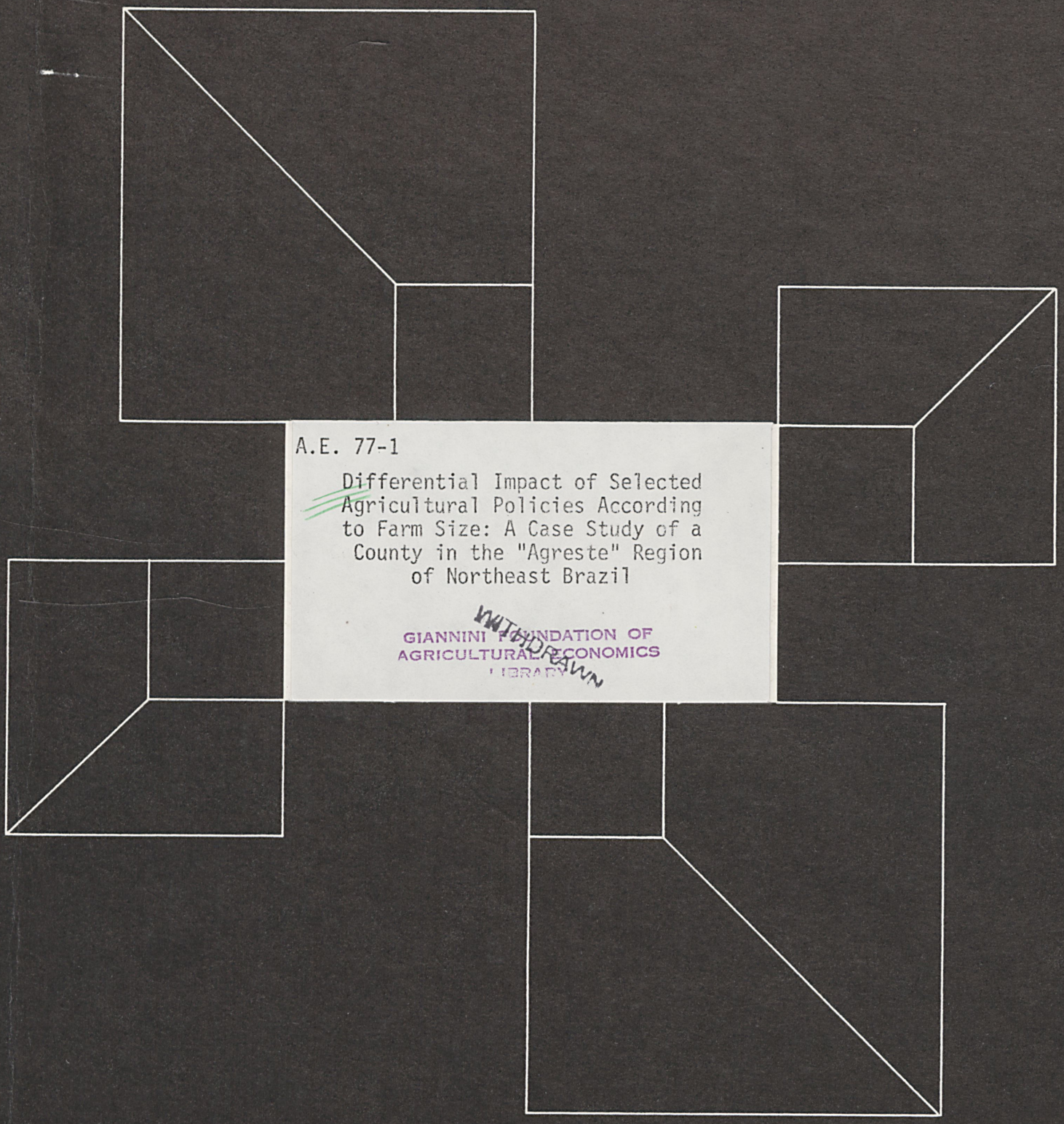

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Differential Impact of Selected Agricultural Policies According to Farm Size: A Case Study of a County in the "Agreste" Region of Northeast Brazil

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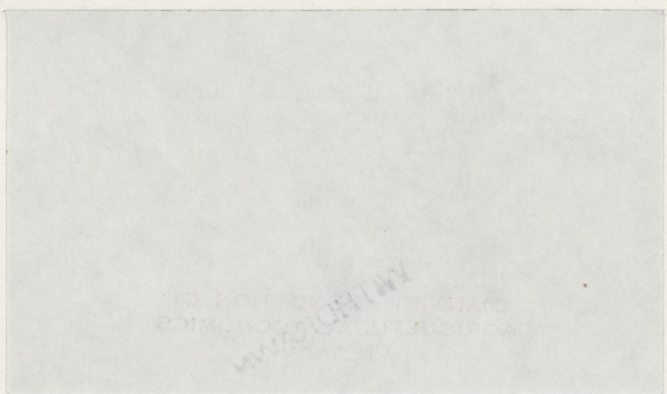

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Differential Impact of Selected Agricultural Policies According to Farm Size: A Case Study of a County in the "Agreste" Region of Northeast Brazil

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by

Douglas Young and Kenton Corum

May, 1977

This paper was originally published in Portuguese as: "O Impacto das Politicas Agrarias no Tamanho das Propriedades: Um Estudo no Municipio de Caruaru, no Agreste Pernambucano." IPEA Boletim Economico (May-June, 1975): 21-33. This English version is translated with minor revisions from the original article. Accent marks have been omitted from Portuguese words in this version.

DIFFERENTIAL IMPACT OF SELECTED AGRICULTURAL POLICIES ACCORDING TO FARM SIZE: A CASE STUDY OF A COUNTY IN THE "AGRESTE" REGION OF NORTHEAST BRAZIL

D. Young and K. Corum*

Introduction

The continuing gap between the Northeast -- particularly the rural Northeast -- and the rest of Brazil is well recognized in government circles. The problem has been described succinctly in the introduction to the Polonordeste program envisioned for the region during 1975-79 (26, p. 2):

> The rural Northeast is still characterized as the largest and most resistant pocket of poverty and backwardness of the country, perhaps of all Latin America . . . . This geographic area today includes about 17 million inhabitants (55% of the Northeast and 16% of Brazil) and an economically active population on the order of 6 million (58% of the Northeast and 17% of Brazil). In contrast, this area contributes only 30% of regional production and 5% of national production.
>
> This means that the average income per capita in the rural Northeast is about 54% that of the region as a whole and about one-fourth that of the whole nation (approximately U.S. $190, as against about U.S. $350 for the Northeast and U.S. $748 for Brazil, in 1974). [Translation by the authors].

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Furthermore, due to remaining marked inequalities in income distribution within the Northeast, both in the rural and urban sectors, the poorer one half of the population is receiving much less that average incomes.

Recognition of the Northeast's poverty is not limited to Brazil. During the wave of international attention on global hunger stimulated by the United Nations World Food Conference, Northeast Brazil was the only area in Latin America singled out as being in the same crisis category as the disadvantaged nations of Central Africa and Southern Asia (30). This regional distinction is all the more ironic in light of the fact that Brazil as a whole has enjoyed one of the higher per capita caloric intakes in Latin America, and her spectacular economic growth in recent years has elicited praise as one of the world's economic "success stories".

The Northeast has not matched the pace of industrialization of the rest of the country. In 1970, well over half (62.6%) of the economically active population in the Northeast was still dependent upon agriculture as compared to 44.3% for Brazil (6, p. 17). Between 1940 and 1970 the percentage of employment devoted to agriculture was reduced by approximately one third in all of Brazil, but only by about one sixth in the Northeast.

The Northeast's heavy dependence on agriculture, paucity of natural resources, and unfavorable climate would likely combine to retard development under any conditions. The severity of two of the most intransigent problems -- extremely low rural incomes and massive

underemployment -- are believed to be further aggravated by the extremely unequal and deteriorating land distribution.

Historically the bulk of the land in the Northeast has been concentrated in a relatively small number of "latifundios" (large farms or ranches) and this remains true today.[1/] Farm establishments with over 200 ha, representing only three percent of the total number of units, accounted for 58% of the land according to the 1970 Agricultural Census in the nine states of the Northeast (14). The logical consequence of this extremely skewed distribution of land has been the concentration of the mass of rural people on extraordinarily small units. Mr. Rubens Vaz da Costa, former President of the Banco Nacional de Habitacao, described this accelerating process of "minifundization" in a recent article (8, p. 70):

> In the past decade (1960-1970, according to the Agricultural Censuses of IBGE) the number of agricultural establishments in the Northeast increased from 1.4 million to 2.2 million with 90% of the increase being observed in the less than ten hectare range. More serious is the finding that agricultural establishments of less than one hectare increased more than any other group, going from 114,000 in 1960 (i.e., 8% of the total) to almost 350,000 in 1970 (16% of the total). The process of rapid "minifundization" of the Northeast is even more evident when the figures regarding employment are analyzed. Two hundred and eighty eight thousand people worked on 114,000 minifundios of less than one hectare in 1960. These numbers jumped to 809,000 people employed on 228,000 minifundios 10 years later. In relative terms, employment on establishments of less than one hectare went from 4% to 10% of all employment in agriculture. The number of people employed on establishments with area between one and two hectares grew almost 400,000 in 10 years, to more

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[1/] Actually at the extreme upper end of the distribution, there was a slight reduction in land concentration in the Northeast between 1960 and 1970. The proportion of total farm land controlled by farms of 2000 hectares and over declined from 19.7% to 16.7%. This tendency, however, is overshadowed by the much more marked increase in the relative number of very small establishments, and the continuing high level of absolute concentration. In 1970, 2000 plus hectare farms in the Northeast, which included 16.7% of all farm land, represented only 0.1% of total establishments and 0.7% of total employment (14).

> than one million in 1970. Thus, about 2 million Northeasterners, representing one quarter of those employed in agriculture in the region, work on establishments of less than two hectares.
>
> [The unacceptable progress of average income in the rural Northeast] . . . . . is in great part due . . . . to the explosion of numbers of people who attempt to derive their sustenance from miniscule areas of poor land, with little or no technical assistance, without the help of mechanical power, without fertilizers, with only a hoe as a principal work tool, and in addition suffering regular dry spells and periodic severe droughts. [Translation by the authors].

Since the creation of SUDENE in 1959 the federal government has invested large sums of money in a variety of programs to reduce the disparity between the Northeast and the rest of Brazil. Several of these programs, such as agrarian reform under INCRA-PROTERRA, colonization of new areas (DNOCS, SUVALE, Trans-Amazonia), agricultural extension (ABCAR), and rural credit (Bank of Brazil, Bank of the Northeast), have been designed to raise productivity and incomes specifically in agriculture where the problem is most severe. In view of the continuing underdevelopment of the rural Northeast it would seem worthwhile to evalute in closer detail the impact of some of these policies and programs on the rural community.

Objectives and Scope

The first objective of this study is to examine the observed impact of three important government agricultural policies on different size groups of farms in a representative Pernambuco county in the "Agreste" region. The "Agreste" is a transitional zone between the arid "Sertao" and the humid "Litoral" in Northeast Brazil. The three policies are:

1 - The assessment of property taxes by INCRA and agricultural unions[2/]

2 - The allocation of technical assistance by ANCARPE

3 - The allocation of agricultural credit by the Bank of Brazil

Next, the influence of these policies on "minifundization", rural-urban migration, agricultural production, rural employment, and well-being of the rural population will be explored. There will be a special effort to examine the consistency of these influences with respect to publicly announced national and regional goals.

Finally, while the study does not recommend new programs, it does provide specific suggestions for modifying or possibly eliminating certain existing policies.

Given the substantial variation among different geographic sub-regions in the Northeast, research focused on one of these sub-regions is considered more illuminating than consideration of the entire region. Therefore, the implications of this analysis are primarily directed to the "Agreste". The zone is characterized by a diversified crop and livestock agriculture carried out on farms of widely varying sizes but with a large number of relatively small family owned and operated units. Although there are variations in the exact boundaries of the zone, both IBGE and SUDENE limit the "Agreste" to five states: Sergipe, Alagoas, Pernambuco, Paraiba, and Rio Grande do Norte (13).

[2/] Secondary attention is devoted to constraints in the agricultural land market imposed by the "Fracao Minima de Parcelamento" (Minimum Subdivision Area) established by INCRA.

Description of Case Study Area

Caruaru county, the case study area for this discussion, is located approximately in the middle of the Pernambuco "Agreste." The county seat, Caruaru, is 130 kilometers west of Recife, the state capital. Caruaru is the largest county in the Pernambuco "Agreste" in both land area and number of inhabitants (both in total and rural population). The city of Caruaru is the largest urban center in interior Pernambuco and serves as a commercial and service center for the central Pernambuco "Agreste." In spite of Caruaru's distinctive position, the structure of its agriculture as revealed by Table 1 is fairly representative of the "Agreste", especially in Pernambuco.

Land distribution data are not available separately for the "Agreste" zone of the five states of interest; however, Table 2 reveals that the unequal land distribution, characteristic of the five "Agreste" states, is shared by Caruaru.

In both Caruaru and the five "Agreste" states as a whole, 4 to 6% of the land supports over half of the farms and 45% of all agricultural employment in the Northeast. Over half of the land is concentrated in the largest 5% of the farms.

Data Sources

Much of the analysis in this study is based on data from unpublished documents obtained through the courtesy of the Instituto Nacional de Colonizacao e Reforma Agraria (INCRA). Evaluation of the property tax burdens in Caruaru county are based on the listing of 1974 tax assessments

TABLE 1: Basic Characteristics of Caruaru County, Pernambuco and of the "Agreste" Zone in Five States of the Northeast

Characteristic[a/]	Caruaru (1 county)	Pernambuco (65 counties)	Paraiba (21 counties)	Alagoas (21 counties)	Sergipe (15 counties)	Rio Grande do Norte (48 counties)
Rural population density, 1970 - (Rural population/ha)	0.36	0.53	0.54	0.46	0.38	0.20
Average size (ha) of agricultural establishments, 1970 -	8.27	8.13	12.15	12.67	10.71	31.62
Average ha temporary crops per agricultural establishment.-	2.06	2.07	2.97	2.37	0.88	2.91
Average ha permanent crops per agricultural establishment -	0.71	0.32	1.22	0.09	0.33	4.23
Average number of cattle per agricultural establishment -	2.91.	2.99	3.14	4.46	4.56	5.48
Number of cattle/ha of agricultural establishments -	0.35	0.37	0.26	0.35	0.43	0.17
Owners as percentage of all agricultural establishment operators	59.0	57.8	51.4	75.7	84.7	50.3

[a/] The first item is calculated from IBGE, Sinopse Preliminar do Censo Demografico - 1970 for the cited States. The remaining items are derived from IBGE, Sinopse Preliminar do Censo Agropecuario - 1970.

TABLE 2: Distribution of Properties, Land and Employment According to Farm Size in Caruaru County and in Five States of the Northeast

Property Size (ha)	Caruaru - 1970[a/]		Total of AL, PE, PB, RN, and SE - 1970 [b/]		
	Cumulative Percentage of -		Cumulative Percentage of -		
	Properties	Total Land	Agricultural Establishments	Persons Employed	Total Land
Less than 1	32.7	1.8	16.2	10.3	0.4
Less than 2	59.4	6.1	34.9	23.0	1.4
Less than 5	79.4	13.9	60.0	45.5	4.6
Less than 10	88.7	21.3	73.4	58.8	8.5
Less than 50	96.9	45.9	92.0	80.0	25.1
Less than 100	98.7	62.3	95.8	85.3	35.8
Less than 1000	99.9	96.2	99.7	97.3	78.5
1000 and plus	100.0	100.0	100.0	100.0	100.0

a/ Source: IBGE, Censo Agropecuario Pernambuco - 1970.

b/ Source: IBGE, Sinopse Preliminar do Censo Agropecuario de 1970.

in the county ("Relacao de Cobrancas") along with the alphabetic listing of all properties and their respective areas.[3/] The examination of relative resource use efficiency by different farm size groups in Caruaru is based on microfilmed records of INCRA's 1972 rural property cadastral survey ("Cadastro de Imoveis Rurais").[4/]

Primary investigations, interviews with officials, and a farm survey in the county by one of the authors are the primary source of data concerning allocation of extension assistance, distribution of agricultural credit and welfare levels of the farm population. The farm survey taken during November and December of 1974 included 72 farm families sampled randomly from five farm size strata.

Impact of Selected Agricultural Policies by Farm Size

Taxation

Table 3 presents, on a per hectare and per cruzeiro of value[5/] basis, taxes assessed by INCRA in 1974 for different farm size groups in

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[3/] Provided by the regional INCRA office at Recife under the research agreement formalized by OF. INCRA/CR03/G/Nº 645/74 (INCRA Coordenador Regional do Nordeste, 09/09/74).

[4/] Provided by the Director of Department of Cadastro - INCRA, Brasilia, in response to a request by the Chief, DDMP-EMBRAPA (Letter Nº C.DOM/002-75 of 09/01/75).

[5/] Average per ha property values for each size group, which excludes the value of the residence and recreation facilities, are calculated from values declared during the 1972 Cadastro published by INCRA (16, 17). As these values are reported in terms of 1972 prices, and the tax assessments are in 1974 prices, the absolute percentage rates reported in Table 3 may be somewhat exaggerated. However, this factor should operate equally over all farm size groups and thus will not affect the relative tax burdens of different groups, the issue of interest here.

Caruaru county. The "farms" (imoveis rurais) in this table refer to separate geographically contiguous properties, and not to total holdings of individual farmers with multiple properties.

The various components of the total assessment are listed separately, as they appear on the annual tax bills farmers receive. These components include two mandatory union contributions, CNA and CONTAG, and the two property taxes, Prefeitura ITR and INCRA tax. CNA stands for the Confederacao Nacional de Agricultura which collects assessments from rural employers while CONTAG receives assessments from farmers classified as rural workers or employees. These "union contributions" are divided between the national and local branches of the organizations. The local county government keeps 80% of the Prefeitura ITR, while the rest of the Prefeitura ITR and the entire INCRA tax is retained by INCRA.

Although the total amount due is divided into several components with different destinations, farmers must pay it in a single sum.[6/] Consequently many farmers regard the charge as a single tax. From their perspective, the total charge represents a single undifferentiated burden on farm finances.

The data presented in Table 3 are based on a sample of all the tax assessments listed by INCRA in 1974 for Caruaru county. It was decided to obtain a sample of at least 50 properties for each size group. The

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[6/] Fines and inflation correction are charged against payments in arrears. Property owners who fail to register, or fall behind in their payments, are prohibited from using federal government services, from selling or renting the property without risk of annulment, and from exercising certain other privileges (19).

TABLE 3: Incidence of Various Components of INCRA Tax Assessments by Farm Size - Caruaru County, Pe., 1974

Property Size (ha)	No. of Properties in the Sample	Total Assessments		Land Taxes				Mandatory Union Contributions				% of Total Assessment	
				Prefeitura - ITR		INCRA Tax		CNA		CONTAG		Land Taxes	Mand. Union
		Cr$/ha	%[a/]	Cr$/ha	%	Cr$/ha	%	Cr$/ha	%	Cr$/ha	%	%	%
less than 1	56	37.60	3.48	0.00	0.00	16.31	1.51	0.00	0.00	21.28	1.96	43	57
1 less than 2	54	30.25	4.25	3.12	0.44	12.10	1.70	0.43	0.07	14.60	2.05	50	50
2 less than 5	60	11.89	2.25	0.88	0.17	4.74	0.90	0.12	0.02	6.13	1.17	47	53
5 less than 10	59	5.95	1.21	0.64	0.13	2.37	0.48	0.17	0.04	2.76	0.56	51	49
10 less than 25	64	3.54	0.76	0.40	0.09	1.45	0.31	0.50	0.10	1.18	0.25	52	48
25 less than 50	70	3.39	0.76	0.62	0.14	1.64	0.37	0.70	0.15	0.43	0.10	67	33
50 less than 100	62	2.78	0.57	0.39	0.08	1.33	0.27	0.61	0.13	0.43	0.08	62	38
100 less than 200	53	2.22	0.46	0.36	0.07	1.20	0.25	0.50	0.10	0.17	0.04	70	30
200 less than 500	32	1.97	0.60	0.43	0.13	1.12	0.34	0.31	0.10	0.12	0.04	79	21
500 less than 1000	3	1.52	0.49	0.37	0.12	0.90	0.29	0.18	0.06	0.07	0.02	84	16
1000 less than 2000	5	1.38	0.32	0.38	0.09	0.81	0.19	0.15	0.03	0.05	0.015	86	14

Source: INCRA, Recife, Pe., "Relacao de Cobrancas - 1974" a "Catalogo Alfabetico de Proprietarios e Condominos"

[a/] Percent (%) refers to the tax expressed as a percentage of the value of land, improvements, livestock, and other durable capital, excluding residential and recreational facilities. These property values are derived from INCRA, "Estatisticas Cadastrais, 1972" (County level - microfilm).

sample was chosen systematically from INCRA's alphabetic listing of properties (15). For example, in the under one hectare group (which totals 104 properties in the county),[7] every second property was chosen, while every eighth property was chosen in the one to less than two hectare group (which totals 408 properties). The three largest groups (200 - 500 ha, 500 - 1000 ha, and 1000 - 2000 ha) each contained less than 50 properties; consequently, all of the registered properties are included in the samples for these groups. The tax assessments listed in Table 3 are the sample averages for each size group.

The overall regressivity (higher rates of taxation for smaller properties) of the tax structure is striking. In terms of the total assessment, the smallest property owners pay 27 times more per hectare of land than do the largest property owners. The regressivity of the CONTAG "union contribution" component is not surprising because owners of small properties are much more likely to work off the farm and therefore to be classified as rural workers. The CNA component exhibits no distinct patterns of regressivity or progressivity. The two direct property taxes (Prefeitura ITR and INCRA tax) contribute substantially to the overall regressivity. The INCRA tax for properties under one hectare is 20 times higher per hectare than for farms between 1000 and 2000 hectares. The ITR is a smaller absolute burden than the INCRA tax and is also somewhat less regressive. No farms in the under one hectare sample were assessed ITR, but one to two hectare farms were charged ITR rates eight times higher per hectare than those for farms over two hundred hectares.

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[7] The total number of properties in each size group is listed in "Estatisticas Cadastrais/1 Recadastramento 1972, Municipio of Caruaru, Pe" (microfilm) Brasilia, 1972 (17).

The expression of taxes on a cruzeiro per hectare (Cr$/ha) basis does not take into account differences in the quality of land. According to INCRA (17), the reported value per hectare of land in small properties is considerably higher than that for larger properties. An average value per hectare (not including residence or recreation installations) of land was calculated for each size group, and the Cr$/ha figure for each tax component was divided by that value. The result expresses each tax component as a percentage of the value of the land and improvements.[8/] As can be seen in the columns, "% of property value", this measure shows the same pattern as the Cr$/ha measure, though to a lesser degree. By this measure, the smallest landholdings pay about ten times the total charge paid by the largest; the equivalent ratio for the INCRA tax is about seven to one.

The limitations of this "percentage of value" measure of tax incidence deserve special comment. First, it should be borne in mind that the land values reported by INCRA are based on unverified declarations by property owners, not independent appraisals. This procedure could cause reported values to differ from market values in an unpredictable manner. Second, the market values themselves may not accurately reflect differences in quality of land, due to institutional distortions of the land market. The sale of properties smaller than the "Fracao Minima de Parcelamento" (FMP), which is equal to 20 hectares in Caruaru county, is restricted by law.[9/] Properties larger than this cannot be subdivided into smaller units for

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[8/] In many countries property taxes are conventionally assessed as a fixed percentage of appraised valuation.

[9/] Law 4504 - X1/30/64 - article 65; Law 5868 - X11/12/72 - article 82; Decree 72.106 - IV/18/73 - article 39.

sale, and existing smaller properties can be sold only as complete units. This restriction greatly reduces the potential supply of small properties and tends to raise their prices above free market levels. Such institutionally distorted higher prices for smaller properties will tend to exaggerate their value as productive resources and to underestimate the amount of tax on small properties, expressed as a percentage of their free market value.

With these possible limitations in mind, the figures under "% of property value" in Table 3 probably represent the best attempt to take land quality into account given the available data.

Allocation of Credit

Researchers have often observed that small farmers in Brazil receive a disproportionately small share of financial credit (27, 31). A frequent explanation is that banks prefer to avoid the high administrative costs and alleged greater risk of small farm loans. The allocation of credit in Caruaru county is not an exception. Table 4, based on results of a 1974 stratified random sample farm survey in the county, reveals that only one farm out of 46 under 20 hectares received credit during the year, while 23% of over 20 hectare farms received loans (25). The bulk of total funds went to the over 50 hectare units which received much larger loans, usually for livestock acquisition.

TABLE 4: Recipients of Agricultural Loans in Caruaru County during 1974 According to Farm Size

Area (ha)	Sample Size	No. Receiving Loans in 1974	Total Value of Credit (Cr$)
Less than 2	14	0	0
2 less than 5	17	1	3,000
5 less than 20	15	0	0
20 less than 50	12	1	3,000
50 plus	14	5	181,802

Source: Oregon State University/EMBRAPA/USAID Project

These patterns are supported by data from the official summary of rural credit activities during 1973 of the Caruaru agency of the Bank of Brazil (4). This agency serves nine counties in the central Pernambuco "Agreste", but bank officials stated that about 40% of rural loans go to residents of Caruaru county. Unfortunately, loan information is not available by farm size group, but Table 5 indicates that nearly two thirds, 63.5%, of all credit went for livestock enterprises which generally are associated with larger farms. The average loan size in many categories indicates that operations obtaining credit are quite large. It is difficult to relate the reported "cultivated area" to farm size since it presumably refers only to that part of total farm area to which the loan will be applied.

TABLE 5: Composition of Agricultural Credit Conceded to Farmers by the Caruaru, Pe. Branch of the Bank of Brazil, January/December, 1973

Credit Category	No. of Loans	Value of Credit			Average Cultivated Area
		Total Cr$	Average per Contract Cr$	% of Total of 1973	ha
Interharvest operating costs	786	2,711,050	3,463	22.9	17
Guarantee of minimum prices - EGF	3	728,000	242,667	6.1	-
Other operating costs	1	199,000	199,000	1.7	-
Establishment of permanent crops	9	63,121	7,013	0.5	4
Improvement of crop enterprises	18	441,520	24,529	3.7	3
Agricultural equipment and machinery	1	4,145	4,145	0.0	-
Vehicles	15	100,052	6,670	0.8	-
Other agricultural investments	5	78,769	15,754	0.7	-
SUBTOTAL FOR CROPS	838	4,336,657	5,175	36.4	-
Livestock operating costs	44	994,628	22,605	8.4	-
Livestock purchases	325	4,608,420	14,180	38.8	-
Improvements of livestock operations	58	1,601,515	27,612	13.5	26
Livestock equipment and machinery	1	33,785	33,785	0.3	-
Vehicles	7	92,230	13,176	0.8	-
Other livestock investments	6	213,769	35,628	1.8	-
SUBTOTAL FOR LIVESTOCK	441	7,544,347	17,107	63.6	-
GRAND TOTAL	1,279	11,881,004	9,289	100.0	-

Source: Banco do Brasil, S.A., "Estatisticas de Creditos Concedidos, Atividade Rural, Regioes Norte e Nordeste", January/December, 1973

The Bank of Brazil has a record much more favorable to small farmers than that of private and state banks (31). Some 61.5% of all loans (22.9% of total value) was allocated to interharvest operating costs, averaging only Cr$ 3,463.00 per loan. However, in view of the relatively high average "cultivated area" (17 ha) for these loans, it appears that "medium" farmers benefit from them more than do "minifundiarios" (small farm owners and "squatters"). A spokesman for the Bank stated that in 1974 the minimum operating cost loan, with rare exception, was Cr$ 3,000 (3). This policy could cut off from credit many of the bottom half of farming operations in the county. These operations are generally smaller than five hectares and normally require loans of less than Cr$ 3,000.

Allocation of Technical Assistance

Local representatives of ANCARPE, the state agricultural extension service, reported that they had been directed to render service only to cattle enterprises in this area (2). In practice, this means mainly large and medium farms, although most of the county's farmers are on small units emphasizing crop production. A current list of ANCARPE extension recipients included 83 farms in the county ranging in size from 9.6 to 2,000 hectares (1). The average farm size on this list was 66.3 hectares; however, excluding a 2,000 hectare farm, the average falls to 38.3 ha. By essentially limiting assistance to farms over 10 hectares, about three fourths of all farms in the county are bypassed. There may be sound reasons for providing assistance only to large and medium size farms, such as the need to allocate very limited personnel and financial resources where they are

thought to yield the greatest increases in total production. The point, however, is that the allocation of extension assistance conforms to the same pattern of discrimination against small farms, and thus the great majority of the rural population, that was observed in the analysis of property taxation and credit allocation.

Effects of Current Policies

The influence of current policies as observed in the case study county clearly seems to favor the development of larger farms. Faced with higher tax rates and less access to credit and technical assistance, small farmers are likely to find it more difficult to adopt modern technology or to increase the size of their holdings. If they are simply unable to meet their tax obligations, the resulting tenure insecurities arising from mounting debt and INCRA penalties could discourage investment in their farms and further contribute to their decline.[10/] The final result of these factors could be sale of all or part of their land and, for most of them, either a marginal existence in the rural sector or migration to the urban sector. A reasonable sequence of changes in status of small landowners and their children might be: (1) owner of yet a smaller piece of land and work as a part-time laborer elsewhere, (2) landless agricultural laborer, or (3) unskilled urban laborer.

10/ During the Caruaru Farm Survey (25), several small farmers expressed fear and anxiety over their inability or difficulty in paying the "INCRA taxes". A substantial number reported being behind in their payments and saw no way of raising the funds to pay taxes in arrears together with fines and inflation correction. Furthermore, many of the smallest farmers had never registered with INCRA, some because they lacked the appropriate title documents to their land and others due to ignorance of the law or reluctance in dealing with the bureaucracy.

An original objective of these policies may have been to facilitate consolidation of land and phase out "minifundiarios." As the discussion in the introduction indicated, however, the available evidence up to 1970 clearly refutes that this objective, whose desirability could be debated, has been achieved.[11/] The relative number of small farms, and to a lesser extent the area controlled by small farms, dramatically increased during the decade 1961-1970.

A leading factor in the proliferation of small "minifundios" and rural-urban migration in recent years has simply been the lack of alternative employment for a substantial part of the rapidly growing unskilled rural population in the Northeast. The problem has been exacerbated by the pronounced trend, to be discussed in more detail later, for larger farms in the region to use less labor in their operations. Progress in increasing rural employment has also been frustrated by the near paralyzation of land reform programs in the Northeast and by the limited success of Amazon Basin colonization schemes in providing alternative employment opportunities. Most Northeastern rural emigration has been more than offset by natural population growth. The substantial current levels of unemployment and underemployment among unskilled workers in urban areas suggest that continuing immigration at present rates may be undesirable. One recent study (10, p. 63) estimated 21.4% of the urban labor force in the Northeast in early 1970 to be unemployed or underemployed, while the comparable figure

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[11/] The "Land Statute" defining most current INCRA policies was implemented in 1964. The existing patterns of credit and extension allocation probably have a much longer history.

for the rural labor force was 10%. Other evidence (5, p. 30) indicates that nutrition levels actually are lower in urban areas of the Northeast than in the rural zone. While it is possible that the large industrialized centers of the South, particularly Sao Paulo, could absorb considerably more unskilled labor from the Northeast, immigration is not likely to be encouraged beyond its current rate.

In review, it has been argued that although agricultural policies which discriminate against small farmers may have been intended to stimulate accelerated rural to urban migration and the phasing out of small "minifundio" in Northeastern agriculture, the number of "minifundios" increased between 1960 and 1970. Furthermore, a reduction in numbers of "minifundios" is not considered likely until there are adequate alternative employment opportunities for the very large potentially displaced populations. Until such employment becomes available, the primary short run effect of these policies could be to contribute additional hardship to one of the poorest groups of the Brazilian population.

Consistency of Current Policies with National Objectives

While it has been argued that certain agricultural policies could impose substantial hardship on smaller farmers in the Northeast, it might also be argued that these effects are justified by the contribution of these policies to overriding long run national objectives. This section will examine the consistency of these policies to three such objectives: 1) Improvement of agricultural productivity, 2) Generation of employment, and 3) Human development and welfare.

Agricultural Productivity

A persistent goal of national policy has been to promote greater efficiency in agriculture. Indeed, the 1964 "Estatuto de Terra" seems to have envisioned property taxation as an instrument to reward those who used their farms efficiently and to punish those who did not (18). Consequently, if small farms were relatively unproductive, the previously analyzed policies might be justified on the grounds that they stimulate more efficient production. In fact, however, the results of this section will reveal that, given the present situation in the Northeast, small farmers are more productive in their use of land and capital than large farmers.

In view of the substantial levels of unemployment and underemployment in the Northeast, and the difficulty in substantially increasing present emigration rates, labor is not considered to be a relatively scarce factor of production, nor is it likely to become so in the near future. Consequently the productivity of agricultural land and capital is considered to be most important. This is particularly true for the densely populated "Agreste" zone to which this study is primarily directed.

The relative average productivity of land and capital on farms of different sizes in Caruaru county is compared in Table 6. Similar information for the entire Northeast is presented in Table 7.[12/] This information was obtained from INCRA records (16, 17).[13/] Productivity is measured in terms of value of production per hectare and also as a percentage of the value of the farm (excluding the residence and recreational facilities). The latter

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12/ Although this region-wide information gives a general overview, area-specific analyses are considered more useful for concrete development planning.

13/ Equivalent productivity indexes were calculated from the recently published IBGE 1970 Agricultural Census results for Rio Grande do Norte (12) and similar patterns were revealed.

TABLE 6: Measures of Land and Capital Productivity by Farm Size in Caruaru County, Pernambuco - 1972

Property Size	No. of Properties	Total Value of Production		Value of Production Sold	
		Cr$/ha	% of Property Value[a]	Cr$/ha	% of Property Value[a]
Less than 1	80	298	27.6	85	7.9
1 less than 2	328	274	38.5	95	13.3
2 less than 5	633	179	33.9	67	12.7
5 less than 10	433	156	31.7	60	12.2
10 less than 25	416	111	23.7	43	9.2
25 less than 50	197	90	20.0	36	8.0
50 less than 100	118	85	17.4	41	8.4
100 less than 200	56	66	13.6	30	6.2
200 less than 500	33	36	11.0	14	4.3
500 less than 1000	3	33	10.6	27	8.7
1000 less than 2000	6	75	17.5	20	4.7
TOTAL	2,303	84	18.9	33	7.4

Source: INCRA, "Estatisticas Cadastrais/1 - Recadastramento 1972" (County level - microfilm), Brasilia, D.F., 1974.

[a] Value of the residence and recreational facilities are excluded.

TABLE 7: Measures of Land and Capital Productivity by Farm Size in Northeast Region - 1972

Property Size	No. of Properties	Total Value of Production		Value of Production Sold	
		Cr$/ha	% of Property Value[a]	Cr$/ha	% of Property Value[a]
Less than 1	12,228	700	42.6	325	19.8
1 less than 2	41,201	465	44.7	224	21.5
2 less than 5	112,148	326	44.8	168	23.1
5 less than 10	108,546	226	43.1	122	23.3
10 less than 25	165,899	158	41.0	93	24.2
25 less than 50	113,541	112	37.3	69	23.0
50 less than 100	89,770	92	37.4	61	24.8
100 less than 200	59,329	72	32.6	51	23.1
200 less than 500	39,356	64	33.0	46	23.7
500 less than 1000	12,187	59	30.9	45	23.6
1000 less than 2000	5,168	50	27.7	39	21.4
2000 and plus	2,815	48	31.8	36	23.8
TOTAL	762,188	75	35.5	51	24.1

Source: INCRA, Estatisticas Cadastrais/1 - Recadastramento 1972 , Brasilia, D.F., 1974.

[a] Value of the residence and recreational facilities are excluded.

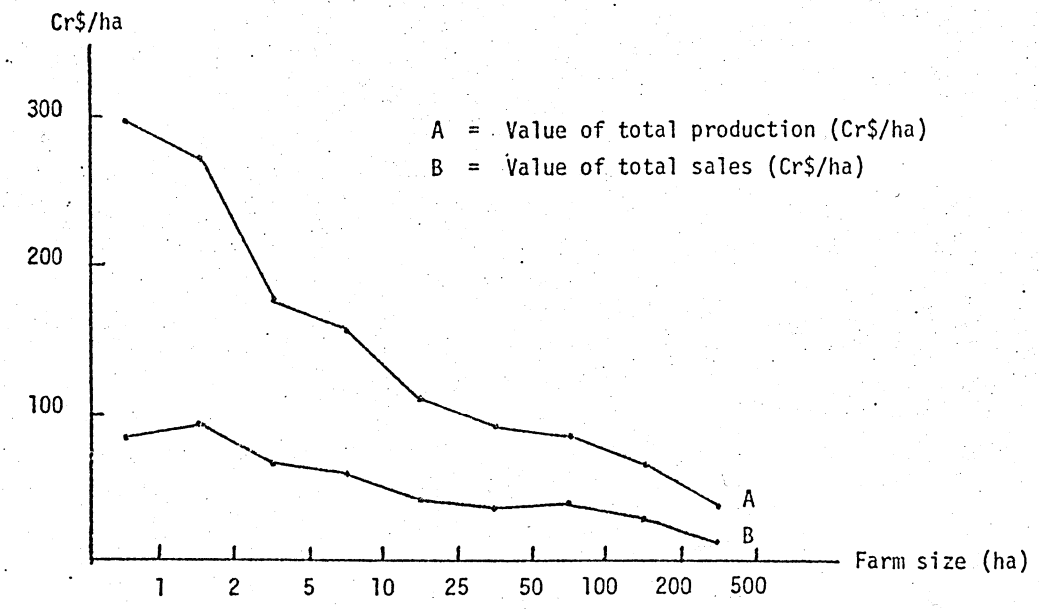

Figure 1. Measures of average productivity of land by farm size, Caruaru County, Pernambuco, Brazil, 1972.

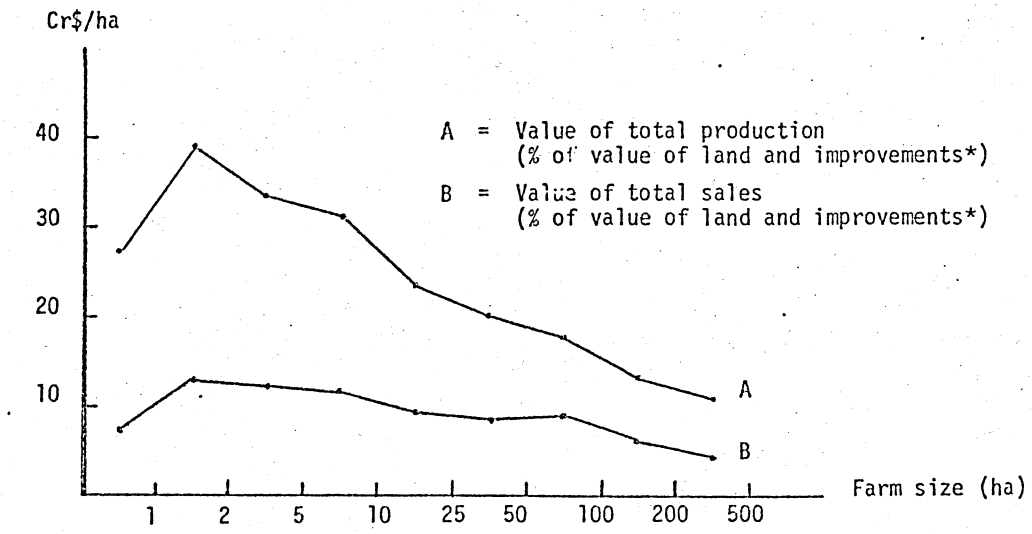

Figure 2. Measures of average productivity of land by farm size, Caruaru County, Pernambuco, Brazil, 1972

* Excluding the value of residential buildings

Source for Figures 1 and 2: INCRA, Estatististicas Cadastrais/1 - Recadastromento, 1972, Municipio de Caruaru, Pernambuco, 1974.

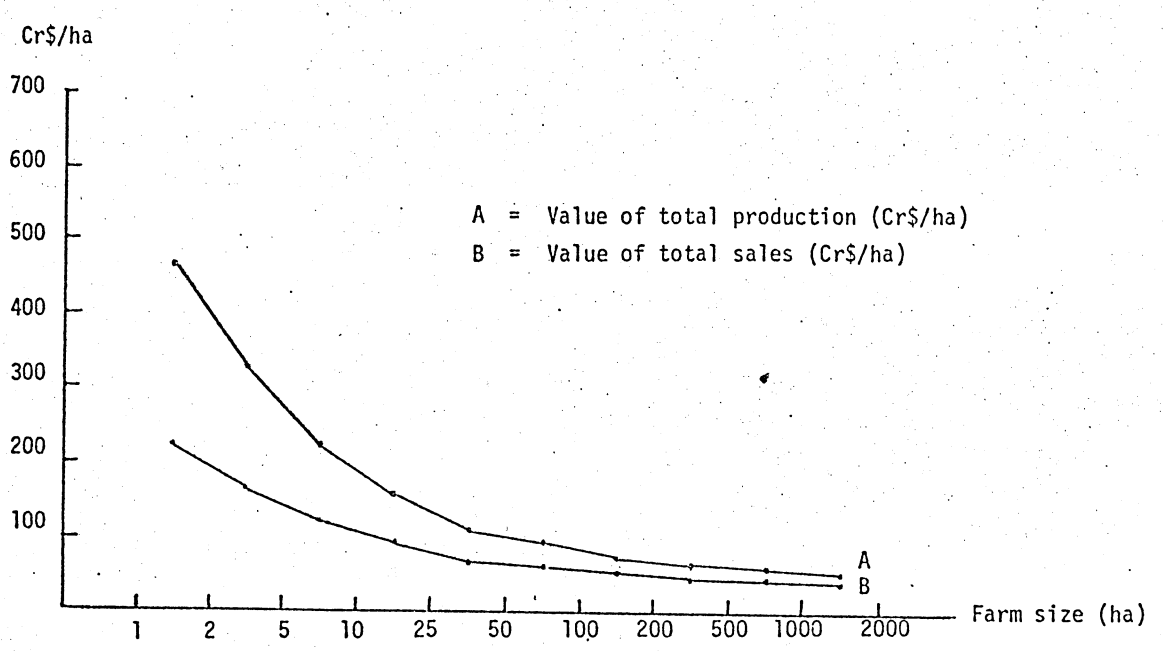

Figure 3. Measures of average productivity of land by farm size, Northeastern Region, Brazil, 1972.

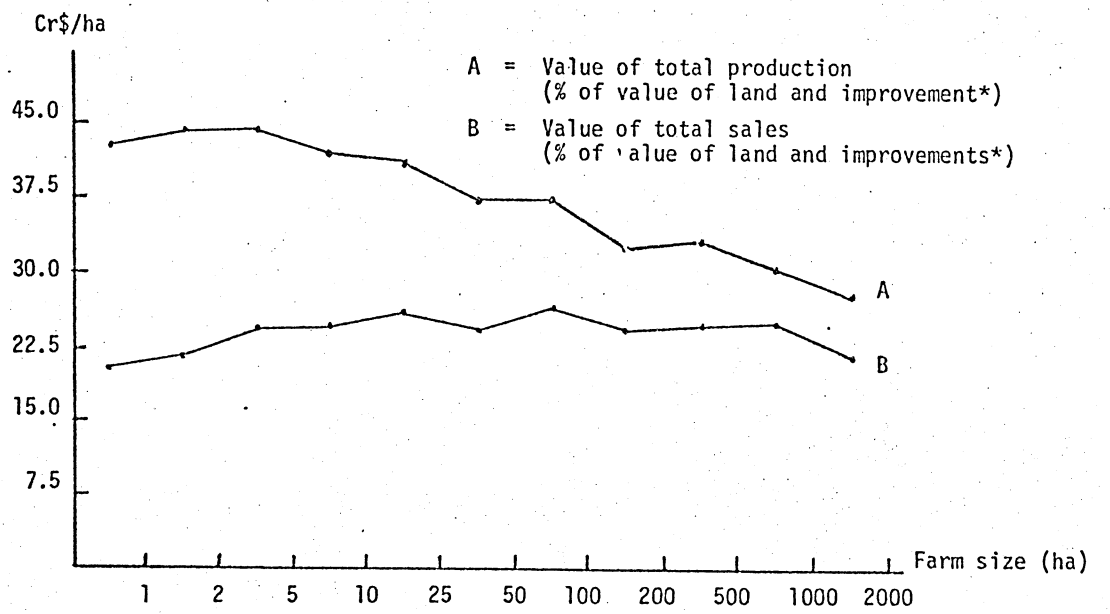

Figure 4. Measures of average productivity of land by farm size, Northeastern Region, Brazil, 1972.

* Excluding the value of residential buildings

Source for Figures 3 and 4: INCRA, Estatísticas Cadastrais/1, Recadastromento 1972, Brasília, 1974.

measure helps correct for differences in land quality and includes the value of certain capital improvements.[14/] Commercialization, as measured by marketed surplus per hectare and per cruzeiro of farm value, is also presented in Tables 6 and 7 and Figures 1-4.

The greater average productivity of land on small farms, which confirms patterns observed in other developing economies (28), is striking. The ratio of land productivity/ha on small farms compared to that on large farms reaches 9:1 for Caruaru county and 14:1 for the Northeast as a whole. The same trend of relatively greater productivity of smaller units holds when measured as a percentage of the value of productive resources, but the trend is less marked as a result of substantial reported differences in land values over farm size. The previously discussed possibility of inflation of small farm land values by institutional restrictions on the sale of small properties may tend to underestimate productivity as a percentage of farm value for smaller farms. The available data certainly provide no basis for discrimination against small properties on grounds of efficiency in the use of land and capital. Indeed the evidence suggests the possibility of substantial gains from land reform as other studies have concluded (7, 9).

From a national resource use efficiency perspective, it is the value of total goods and services produced that is important. Consequently the measures of production sold per ha or per cruzeiro of value should not be construed as efficiency measures. Indeed, the fact that smaller farmers

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[14/] This is subject to the possible shortcomings in the owner-declared land values which have been discussed above.

retain a substantial fraction of their production for subsistence, thereby avoiding selling and purchasing marketing margins, helps stabilize real incomes of this poor group and thus equalizes the distribution of real income.

In spite of high subsistence requirements, the data in Tables 6 and 7 and Figures 1 - 4 reveal that smaller farmers generally have higher or equal commercialization or sales rates than larger farmers. This result indicates that a small and medium farm economy need not lead to higher food prices for urban consumers or a reduction in agricultural exports.

Employment

A major component of government policy is to create new sources of employment for the labor-surplus Northeast. One objective of the Polonordeste program of the second National Development Plan is to create more employment in the rural interior to slow the influx of unskilled labor to urban centers.

An important question is what will be the effect on agricultural employment of policies favoring the growth of larger farms? Table 8 reveals that smaller farms provide well over 100 times more employment per hectare than farms over 1000 hectares, and the differences are marked throughout the size distribution. Somewhat higher labor-land ratios on smaller farms are consistent with the higher quality of land on smaller farms implied by the land values reported in the 1972 INCRA records. Higher quality land could permit more intensive use of labor, but it is difficult to explain such extreme differences in use of labor per hectare solely

on the basis of modest differences in land quality. Small farmers are forced to use a much higher proportion of potentially arable land for labor intensive and productive cropping operations in order to survive.[15/] Many larger farmers, on the other hand, prefer extensive livestock operations, perhaps because they desire to minimize managerial and labor problems. These differences in enterprise composition contribute to the notable differences in average land productivity over farm sizes discussed in the previous section.

TABLE 8: Employment and Land Use According to Farm Size in the Northeast, 1970

Farm Size (ha)	People Employed/ha	% of the Farm Area in Crops
Less than 10	1.065	62.3%
10 less than 100	0.134	21.6%
100 less than 1000	0.028	9.5%
1000 less than 10000	0.008	4.5%
10000 and plus	0.003	2.9%

Source: Calculated from data in Tables 2, 4, and 15 (23) whose original source was the 1970 Agricultural Census

[15/] See Lina and Sanders (24) for evidence of this phenomenon in the Central "Sertao" of Ceara also.

Furthermore, during the last 10-20 years large farms in the Northeast have sharply reduced total employment while increasing numbers of small farms have supplied all the regional growth in agricultural employment (23, Table No. 11). Employment per unit area has remained relatively constant for small farms since 1940 but has been cut by about one half on farms over 100 hectares (23, Table No. 15). Particularly in the "Agreste" zone, this process is encouraged by the tendency of larger farms to increasingly emphasize extensive livestock operations.

The main point of the preceding evidence is that policies encouraging the elimination of small farms in favor of larger units could displace large numbers of people, many of whom are not likely to find employment on the remaining consolidated units.

Human Development and Welfare

"Minifundiarios" in the Northeast, many of whom are part-time laborers or sharecroppers as well, represent one of the poorest groups in Brazil. Many are at the brink of subsistence and reoccurrence of a severe drought of the type which has plagued the region in the past could endanger the survival of many people and heavily tax government services. It is hoped that these people will eventually find more remunerative and secure employment in agriculture or in other sectors of the economy. Until such alternative opportunities become available it would seem consistent with current national administration emphases on human and social development and income equalization to increase the welfare, or at least minimize the hardship, of this group.

Aside from fully justified humanitarian motives, there are sound arguments from the perspective of long run regional economic development to avoid marginalizing the growing number of "minifundiarios" in the Northeast. Income, nutrition, and educational levels, already critically low, may become so depressed that the capacity of this group to ever make the transition to alternative employment could be severely affected.[16/] Policies that impede the development of this large Northeastern human resource pool could contribute to perpetuation of rural poverty and thereby impose a permanent drag on regional development.

On the other hand, more generous taxation, credit, and technical assistance policies toward "minifundiarios," carried out simultaneously with efforts to create new jobs and expand social services, could enable them to invest more in their own nutrition, health care, and education. Adequate investment in human development has been repeatedly shown to be one of the primary requisites of economic growth and development (29).

In the final analysis, the strongest argument in opposition to agricultural policies that discriminate against small farmers may be their inconsistency with Brazil's current social welfare goals and the requisites of strengthening human resource investments to accelerate regional economic development.

16/ For example, the well established effects of early childhood protein deficiency on mental development could permanently handicap future employability. In the previously cited 1974 Caruaru Survey, 0 - 2 hectare "minifundio" families were found to have substantially lower nutrition levels (value of per capita weekly diet averaged only Cr$ 17.00, approximately U.S. $3.00) and school attendance rates than the rest of the farm population. Meaningful improvements were observed even on slightly larger 2 - 5 hectare farms.

Summary and Recommendations

The evidence examined in this study has indicated that three important instruments of agricultural policy, land taxation, credit, and technical assistance, tend to favor large farms over small farms in the county of Caruaru, Pernambuco, Brazil. However, small farms have been shown to be more productive in the utilization of land and capital, to absorb more labor, and to support that segment of the population for whom welfare and human resource development levels are severely depressed. These results have been based on detailed information for this county, supported by geographically broader based data for certain topics.

The analysis has indicated that in the long run these policies could encourage concentration of land ownership in relatively few large farms with an attendant concentration of the rural population on proliferating small farms. This concentration could also stimulate the migration of unskilled labor to urban centers, thereby aggravating already serious problems of urban unemployment and poverty. Furthermore, if present land use and productivity patterns for farms of different sizes are predictive, this process could substantially reduce total agricultural output.[17/]

[17/] The limitations of average production as a measure of land productivity must be kept in mind. The marginal productivity of each factor of production would be more useful in making policy recommendations than average productivities. In the absence of data adequate for the estimation of marginal productivities, however, the substantial differences in average productivities of land and capital of large and small farms at least suggest the existence of similar differences in corresponding marginal productivities.

The historical record up to 1970 suggests that a large portion of the massive pool of potentially displaced small farm labor really has no alternative but to stay on the land regardless of external pressures; consequently the likely outcome of continuing discriminatory policies is to further marginalize this great mass of Northeasterners.

A lasting and socially less costly solution to the problem of accelerating "minifundization" of Northeastern agriculture requires programs that promote:

(1) The creation of alternative employment paying a living wage, either in agriculture through land reform, production assistance, or settlement programs, or in labor-intensive industrial or service sector development.

(2) The improvement of general nutrition, health and education levels so that these people can successfully enter into the mainstream of the Brazilian economy, rather than become increasingly marginalized from it.

While the preceding two points may help indicate fruitful directions for new programs, the definition of specific new policies and projects for Northeastern rural development is left to the responsible government and international agencies. Recent initiatives of the present administration (1) to promote social and human development in the second National Development Plan, (2) to use income taxation and salary policies to equalize income levels, (3) to accelerate land reform,

and (4) to provide new rural employment through Polonordeste, represent encouraging developments in these directions. The current priority of the World Bank to support projects primarily intended for the poorer segments of rural society is also encouraging.

In light of these priorities, and also in light of the extensive evidence presented in this paper, there is justification for substantially modifying certain policies examined in this study. Such a decision could benefit from more specific research with broader geographic representation, but we feel that the preliminary evidence presented here fully warrants a policy reevaluation. While the original rationale behind certain policies such as the taxation scheme may have been sound, the current effect of these policies at the farm level contributes to adverse consequences that were not foreseen.

What specific components of present policy would profit most from reappraisal? Based on this preliminary study, the following specific suggestions are offered:

1. The complex process for calculating the ITR and INCRA taxes should be reevaluated and simplified in an effort to eliminate their present pronounced regressivity. The use of owners' declarations of land value as the basis for taxation raises the possibility of distortions of unknown magnitude in the measurement of land quality. By basing these taxes on <u>appraised</u> value of productive resources and using them as an instrument to reward higher productivity, a tremendous reduction in present regressivity could be achieved. Consideration should be given to entirely eliminating both taxes for very small farms.

2. Although the regressivity due to mandatory union contributions might be justified by a "benefits received" argument, these assessments also deserve examination, particularly CONTAG. It does not seem fair to attach these union contributions to the INCRA tax bill so that the same heavy penalties for non-payment apply to them.

3. Is the intervention in the land market decreed by the "Fracao Minima de Parcelamento" worth the social and efficiency costs it imposes? Does it really impede the fragmentation of land, or does it simply force fragmentation underground, resulting in tenuous and insecure tenure arrangements that dilute incentives for modernization and investment in modern inputs? The desirability of maintaining the FMP should be seriously evaluated.

4. A general or partial annulment of past debts of farmers who are in arrears in tax payments, or who have never registered with INCRA, would probably generate considerable good will toward the government and strengthen land tenure security attitudes. Such an amnesty could be an effective prelude to reform of the tax structure.

5. Official guidelines or informal attitudes that tend to cut off smaller farmers from credit and technical assistance should be carefully reviewed.[18/]

[18/] It could be argued that because large landowners use a smaller fraction of their land, and use it less intensively than small landowners, governmental expenditures on extension of credit and technical assistance to large landowners have greater potential returns. As the data presently available are insufficient to confirm or disprove this argument, it can be argued with equal validity that because large landowners already have more access to credit and technical assistance and yet are less productive than small landowners in their use of land and capital, the extension of credit and technical assistance to small landowners has greater potential returns.

This study has indicated that policy modifications along these lines may have some potential for promoting productivity, employment, and welfare objectives. Obviously such policy reforms represent only one relatively small step in the struggle to raise living standards in the rural Northeast. There are a great number of other institutional, cultural, technical, and ecological constraints that retard agricultural development in the Northeast. However, the elimination or modification of existing undesirable policies might be achieved with considerably less political delay and financial cost than the launching of potentially controversial new policies or expensive new development projects. For this reason, consideration of such reforms is a logical prelude to other development efforts.

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