Integrated Rural Development Programmes in Brazil's Northeast: Production, Employment, and Income Effects

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Abstract: Integrated development programmes were implemented in many Latin American countries in the 1970s in response to the failures of industrialization policies to alleviate poverty. A massive integrated rural development programme in Brazil's Northeast is assessed with respect to its production, employment, and income effects. Exports, import substitution, and commercial crop and livestock production expanded. Employment effects were meagre and negatively correlated with income; coupled with technological and crop mix changes, labour is displaced. Income effects are skewed, reinforcing inequalities in rural income. Integrated rural development programmes in Brazil have thus sped up capitalist development, maintaining the inequalities of Latin American economic growth represented on the one hand by rural poverty and underemployment and on the other by a worsening of urban conditions in slum areas.

Introduction

Integrated rural development programmes (IRDPs) were implemented in many Latin American countries in the 1970s, representing a new approach as a response to the unintegrated programmes of land reform and to the Green Revolution that had not achieved egalitarian rural development. Particularly in Latin America, land reform programmes have achieved only marginal changes in agrarian structure and meagre benefits to poor rural producers (de Janvry, 1981). Thus, as land reform and the Green Revolution were questioned either as programmes to increase production or to alleviate rural poverty, international agencies (including the World Bank), proposed an integrated approach to rural development, which combines land policies, technological innovation, credit, infrastructure, education, health, and nutrition.

Integrated rural development programmes were started in 1974 in Brazil, with strong support from the World Bank. The Northeast is the poorest area of the country and one of the largest areas of rural poverty in the world. Agricultural technology is considered to be traditional, and the region lags behind the country as a whole in average income, physical facilities, and social infrastructure. Notwithstanding those facts, agricultural production growth has averaged higher than population growth, and the region has been increasingly integrated with the richer and more developed regions of Brazil. Thus, the agricultural sector is far from stagnant, although socioeconomic conditions of the rural poor have been changing only slowly.

The purpose of this paper is to assess some of the consequences of a massive integrated rural development programme in Brazil's Northeast, in particular its production, employment, and income effects.

Method of Analysis

Total employment in rural areas is expressed as:

$$(1) \quad T = l'_1 x + l'_2 v,$$

where x is a $(n \times 1)$ vector of cultivated land, v a $(m \times 1)$ vector of other goods and services produced, l_1 a $(n \times 1)$ vector of labour per unit of area required to produce x, and l_2 a $(m \times 1)$ vector of labour required to produce v.

Employment variations in agriculture occur due to changes in total cultivated land (x), in the crop mix (x_i/x_j), and in the vector of labour requirements (l_1). As total cultivated area increases, total employment also increases, other factors held constant. But even if total area does not change, total employment can increase or decrease due to an expansion or contraction of labour-intensive crops, which also occurs due to technological changes, usually followed by changes in the crop mix. Technological changes tend to be labour-saving biased, but the increased productivity leads to expansion of total cultivated land and thus (at least to some extent) offsets the negative effects on total employment.

Employment variations were calculated as the difference between employment prior to the IRDP and employment at the evaluation period. A limitation of this method is that it ignores the autonomous changes occurring in the area, mixing those changes with the ones resulting from the

IRDP implementation. Also, data were available only for producers directly affected by the programme; as a consequence, calculating indirect effects including changes in urban employment was not possible. The final equation for employment is:

$$(2) \quad \Delta T = \Sigma\Sigma\, l_{jiu} X_{juti} - \Sigma\Sigma\, l_{juto} X_{jito} = \Sigma\Sigma\, \Delta l_{ji} \Delta X_{ji} \,,$$

where $\Sigma\Sigma$ represents sums over i and j, j stands for the jth farm, and i for ith product.

Changes in rural agricultural income are due to changes in cultivated land, crop mix, average land productivity, and net income per unit of product. Total agricultural income is:

$$(3) \quad R = p'_1 Ax - c'x + p'_2 y \,,$$

where p_1 is a $(n\times1)$ vector of prices received by farmers, p_2 a $(m\times1)$ vector of net income received for the sale of other goods and services, c a $(n\times1)$ vector of costs paid by farmers, and A a $(n\times n)$ diagonal matrix of productivities.

In order to assess the income distribution effects, the sociostructure must be considered. In particular, small farmers in the Northeast are heterogeneously represented by small landowners, sharecroppers, and settlers. Three groups are considered: large and medium size farmers, small farmers, and microfarmers (the latter including the very small farmers, sharecroppers, and settlers).

Large and medium size farmers' income includes the income obtained in areas exploited directly and areas exploited by sharecroppers and includes the difference in prices of products bought from small farmers, sharecroppers, and settlers and the prices received from those products:

$$(4) \quad R_1 = p'_1 BAx + (p_1 \text{-} p^-_1)'(B\text{-}I)Ax - c'Gx \,,$$

where B is a $(n\times n)$ diagonal matrix of sharecropping shares, p_1 a $(n\times1)$ vector of prices paid by farmers to sharecroppers, c a $(n\times1)$ vector of input costs, and G a $(n\times n)$ diagonal matrix of cost shares (it expresses landowners' participation in production costs).

Small farmers' income is composed of the value of commercial and subsistence production and the revenue (wages) from selling services and labour:

$$(5) \quad R_2 = p'_1 Ax - c'x + p'_2 y \,.$$

Sharecroppers' income comprises the revenue obtained from selling their share of commercial and excess subsistence crops, the value of consumed subsistence crops, and the revenue (wages) of selling services and labour:

$$(6) \quad R_3 = p^-{'}_1 (B\text{-}I)Ax - c'(G\text{-}I)x + p'_2 y \,.$$

Technological changes frequently lead to changes in social relations of production, as also occur with changes in crop mix, all changing simultaneously as product and input prices and wages change.

Income variations were also calculated as the difference between income by group prior to the IRDP implementation and income at the time of the evaluation. The limitations noted before also apply to the calculation of income variations.

Production, Employment, and Income Effects

Net Production Effects

Calculations were made for three projects, implemented respectively in the humid Ibiapaba Mountain, in the semiarid area comprising the Ruralnorte project, and in the Paraguaçu. Data presented in Table 1 (page 234) show that two projects—PROCAFÉ and PROÁLCOOL—to promote and expand commercial and export crops (coffee and sugarcane for alcohol) were far more important than all the IRDP production effects. In fact, subsistence crops are increasingly being replaced by commercial and export crops. Only in Ibiapaba was cassava production increased. Maize and bean production increased in Paraguaçu, but that case, due to intercropping with pasture, was a short-term phenomenon. Thus, notwithstanding some increase in vegetable production, the

combined effects of IRDP and other projects were to speed up the expansion of cotton, coffee, sugarcane for alcohol, and livestock, none of them basic foods for rural dwellers.

Net Employment Effects

Net employment effects are negligible as a percent of total employment (less than one percent). In Ibiapaba, total employment credited to IRDP—243,513 labour days—is substantially less than the 601,776 credited to PROCAFÉ and the 330,000 credited to PROÁLCOOL. For the three projects, 1,932,997 labour days resulted from actions connected with the programme. But considering only the net effects, Table 1 shows negative effects in Ibiapaba and the highest positive effects in Paraguaçu. While total acreage was expanded, technological and crop mix changes are responsible for those meagre results. In fact, the results by farm group demonstrate that livestock expansion in Paraguaçu, a medium and large farm activity, led to decreased labour absorption, while

Table 1—Summary of Results of IRDP Effects

	Ibiapaba	Ruralnorte	Paraguaçu
Net Production Effects (t)			
Tradeable crops:			
Coffee	4,298	–	–
Sugarcane	5,000	–	–
Commercial crops:			
Vegetables	106	–	89
Orange	24	–	19
Passion fruit	373	–	–
Cotton	–	7,799	–
Tobacco	–	–	1,022
Castor beans	–	–	1,599
Basic foods:			
Cassava	231	–	4,411
Maize and beans	–	–	12,665
Livestock:			
Forage	–	472	–
Livestock (head)	–	–	(19,773)
Total	10,032	8,271	19,805
Net Employment Effects (labour days)			
Microfarms	-7,772	56,654	454,946
Small farms	3,086	45,264	86,439
Medium and large farms	-73,561	1,443	-99,732
Total	-78,247	103,361	441,653
Net Income Effects (dollars)			
Microfarms	817	176	-13
Small farms	1,480	405	-41
Medium and large farms	2,595	1,219	624
Average	1,375	315	62

the increase in microfarms is credited mainly to food production intercropped with pasture, a short-run effect since food can only be intercropped 1 year before pasture covers the land. Also, in the Ruralnorte, livestock is a large farm activity, while cotton is produced mainly by microfarms, including sharecroppers. Vegetables produced in Ibiapaba are moderately labour intensive but are substituted for other crops (including staple food) that are extremely labour intensive. Thus, the net employment effects are meagre, a poor result compared with the objective of rural development programmes of keeping rural population on the land and decreasing migration to urban centres.

Net Income Effects

Net income effects are clearly different for the three areas. But in all three, the effects are unevenly distributed geographically and among groups of farmers. The highest increments are observed in Ibiapaba, in contrast to the decrease in employment. Technological and crop mix changes are responsible for the displacement of labour as income increases and income distribution becomes more concentrated. In Ruralnorte, traditional cotton production was financed. A dry area with a low agricultural potential, it benefited from economic incentives and a mild climate, thus resulting both in a reasonable increase in income and a slight increase in employment. In recent years, though, a 3 year drought decimated livestock production and the cotton crop. In Paraguaçu, the expansion in employment occurred with a decrease in net income.

Microfarms are composed of peasants who produce mainly for subsistence, although they intercrop pasture for the landowners. That temporary employment is explained by the lack of employment alternatives in rural areas. The long-run effect is discernible in the case of medium and large farms in which the livestock expansion actually displaced labour. In fact, rural development in the three areas was very selective; where it increased income somewhat, only a small number of farmers benefited.

Integrated Rural Development: An Overview

Capitalist development in Brazil's Northeast is rapidly changing the traditional class structure. In particular, the latifundia are giving way to modern capitalist farmers. Basic crop production has increased less than population growth, while export crop and import substitution production has speeded up. Sharecropping is extinct except in areas of recent livestock expansion, such as in the Paraguaçu Valley. Thus, integrated rural development in Brazil's Northeast seems to be reinforcing capitalist development, with all the inequality aspects that attends capitalism in Latin America.

The three projects studied show differences that deserve analysis. In the most fertile areas, the IRDP reinforced small and medium farmers and oriented production towards export and high income elasticity crops. Income increased, but technological change, notwithstanding total area expansion, resulted in labour displacement. In more virgin lands, IRDP made economic integration possible, which, if in the short run it resulted in increased employment (although at a very low labour productivity), is certain to become a labour-displacing process in the medium run. In fact, such a result is observed in large farms and is expected to continue only while pasture land is being intercropped with basic foods in sharecropping arrangements. Finally, in a third group, the Ruralnorte results show that, in lands of low fertility, the IRDP can alleviate rural poverty in years of average rainfall but brings no permanent stability of income and employment. An overview of the IRDP in Brazil cannot but conclude that it does not constitute a programme with real possibilities of alleviating rural poverty either by increasing employment opportunities or by increasing incomes for the majority of farms in an equitable manner.

Note

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Reference

Janvry, A. de, *The Agrarian Question and Reformism in Latin America,* Johns Hopkins University Press, Baltimore, 1981.