Rural Poverty Reduction in Brazil: Towards an Integrated Strategy
(In Two Volumes)

Volume I: Policy Summary

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Weights And Measures

The Metric System is used throughout the report.

Fiscal Year

January 1 to December 31

Abbreviations and Acronyms

FUMAC = Municipal Fund for Community Support (Fundo Municipal de Apoio Comunitário)
FUMAC-P = Pilot Municipal Fund for Community Support (Fundo Municipal de Apoio Comunitário - Piloto)
FUNRURAL = Rural Pension System
IBGE = Brazilian Institute of Statistics and Geography (Instituto Brasileiro de Geografia e Estatística)
INCRA = National Land Reform Institute
LSMS = Living Standard Measurement Survey
NE = Northeast Region
NGO = Non-Governmental Organization
NRDP = Northeast Rural Development Program
PNAD = Pesquisa Nacional por Amostra de Domicílios
PPV = Living Standard Measurement Survey (Pesquisa sobre Padrões da Vida)
PROCERA = Family Farm Credit for Land Reform Beneficiaries, now replaced by PRONAF
PRONAF = Family Farm Credit
RGPS = Public Pensions System for Private Sector Workers
RNF = Rural Non-Farm
R-NRDP = Reformulated Northeast Rural Development Program
RPAP = Rural Poverty Alleviation Program
SE = Southeast Region
TA = Technical Assistance

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Volume II of the report contains the background studies commissioned for this report and are based on the following contributions:

Chapter 1. A Poverty Profile of Brazil  
by Claudia Romano (Consultant, Sao Paulo).

Chapter 2. Dynamics of the Brazilian Small Farm Sector  
by Guilherme Leite da Silva Dias (Professor, University of Sao Paulo, USP) and Alexandre Lahoz Mendonça de Barros (Visiting Professor, University of Sao Paulo, USP).

Chapter 3. An Assessment of Rural Labor Markets in the 1990s  
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Chapter 4. Land Markets and Rural Poverty Alleviation  
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Chapter 5. Determinants of Farm Revenues and Factor Returns for Poor Farmers in Brazil  
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Chapter 6. Poverty and Non-Farm Employment in Rural Brazil  
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Chapter 7. Rural Education  
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Chapter 8. Rural Pensions  
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Chapter 9. Public Policies to Reduce Rural Poverty: A Selective Assessment  
by Joachim von Amsberg (Lead Economist, World Bank).
# Rural Poverty Reduction in Brazil: Towards an Integrated Strategy

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EXECUTIVE SUMMARY

i. This report constitutes a step towards the objective of designing an integrated strategy for rural poverty reduction in Brazil. The report contains an updated and more detailed profile of the rural poor in the northeast (NE) and southeast (SE) of Brazil; identifies key determinants of rural poverty in these regions; and proposes a five-pronged strategic framework in which to couch a set of integrated policies that could effectively help to reduce rural poverty in Brazil. This tentative set of policy options was identified via an analysis of rural policy determinants complemented with an evaluation of relevant current public programs and six in-depth thematic studies that bear on critical components of the proposed integrated policy approach aimed at reducing rural poverty in the NE and SE of Brazil: (a) the dynamics of the Brazilian small farm sector, (b) rural labor markets, (c) rural land markets, (d) RNF employment, (e) rural education, and (f) rural pensions.

ii. While this study emphasizes primarily microeconomic events—such as the impact of schooling, income transfers, and access to land and credit—poverty reduction requires both economic growth (macro-level) and specific anti-poverty policies (micro-level). Especially in Brazil, where agriculture represents less than 10% of GDP and about 23% of employment, fast-growing employment in urban areas and expansion in domestic demand for farm products that would result from fast growth in the overall economy—particularly for small farmers producers of non-tradables—could go a long way in reducing rural poverty, even if the agricultural economy does not grow very fast. Essentially, achieving a significant reduction in rural poverty without rapid overall economic growth would be quite difficult in Brazil. Note also that this report covers only the NE and the SE regions of Brazil due to household level data constraints. Thus, while the bulk of the rural poor live in the latter regions, the issues addressed and the tentative strategic framework for rural poverty reduction might need to be somewhat adapted in other regions. Some of the potentially important issues in a poverty reduction context that could not be covered include: (i) the impact of commercial agricultural policies, (b) the effect of overall government programs in rural areas that are not poverty focused per se (e.g., the substantial spending by the Ministry of Agriculture and overall credit programs), and (c) the often complex and important environment-poverty inter-linkages.

iii. The bottom-line in terms of strategy recommendations is the need for a set of integrated policies that canalizes the rural poor into multiple poverty exit paths. The rationale underlying this conclusion emerges from a synthesis of several key issues identified in this report. First, the poverty profile indicates that the rural poor in the NE and SE of Brazil is not only large—about 9.8 million people—but also very heterogeneous in terms of income sources, quantity and quality of human- and physical-capital endowments, and location. This is suggestive of multiple possible poverty exit paths and this should be reflected in a set of integrated policies that is tailored to capitalize on the heterogeneous living conditions of the rural poor. The need for an integrated approach is further underscored by synergetic effects among policy relevant determinants of rural poverty in farm households. A key finding in this context is that returns to farmland are highly dependent on the levels of complementary productive (e.g., purchased inputs, machinery, etc.) and demographic factors (e.g., age of operator, education, etc.). Consequently, for land to have a large productivity and revenue increasing impact in farming, it appears necessary to simultaneously improve the levels of other factors such as purchased inputs and machinery.
**A Profile of Rural Poverty: Updated Facts and New Findings**

iv. Designing effective rural poverty reduction programs in a large and diverse country such as Brazil is difficult in a vacuum with respect to knowledge of a disaggregated rural poverty profile.

- Poverty continues to disproportionately affect the rural NE where the poverty incidence is estimated to be about 49% (compared to 24% in the rural SE).

- Rural poverty reduction in Brazil remains a substantial challenge: approximately 43% of the poor in the northeast (NE) and southeast (SE) of Brazil are rural (i.e., 9.8 million people).

v. The importance of poverty estimates lies not *per se* in specific numbers, but rather in the identification of the most deprived groups. This is borne out by previously unavailable estimates for Brazil via disaggregation over both detailed geographical and income-group categories:

- Rural poverty disproportionately affects the northeastern states of Brazil, particularly Maranhão, Piauí, Ceará, Alagoas, and Bahia. Even within the NE, the overall impression is one of considerable geographical (and presumably agro-climatic, though this level of disaggregation is presently not feasible due to data constraints) diversity regarding the incidence of poverty.

- The bulk of the total estimated poor in the rural NE and SE, 83.6% (about 6.7 million people) and 90.3% (about 1.6 million people) respectively, are found to be farm households located in remote, isolated, sparsely populated and low productivity areas, for whom income from farming and agricultural labor represents approximately 70% of their total household income. Regardless of region, those that receive their main income via farming or farm labor are consistently the poorest group, whilst non-agricultural workers comprise the relatively better off group. Public pensions are the main source of non-labor income.

- Location matters. Poverty incidence is lower in rural areas directly adjacent to, but not formally incorporated into the urban perimeter of municipalities. Similarly, the share of Rural Non-Farm (RNF) income increases in these areas. However, given the geographically biased distribution of poverty towards remote rural areas, for the bulk of the rural poor RNF income represents only a small fraction of income.

vi. Compared to their urban counterparts, the rural poor in the NE and SE of Brazil are worse off in terms of demographics, educational achievement, access to and quality of services. For instance:

- In 1996, only 43% of households in the lowest income quintile from the rural NE had access to electricity;

- Of the latter group, an average of 75% of the household heads are illiterate;

- In the rural NE, 27% of teachers have not completed their primary education and only 15% of children are enrolled past the fourth grade; and

- Only 2% of poor farms received some form of technical assistance.
vii. Aging small farmers and the relatively high proportion of female-headed rural households emerge as particular groups to consider in the context of safety net policies:

- The average age of the head of household in small farms is high and there appears to be a strong relationship between aging, productivity and poverty in small farms.

- Female-headed households represent an approximate 15% of all rural households in the NE (12% in SE) and this proportion reaches up to 30% among rural households whose main income source is non-agricultural (20% in the SE). In these households where husbands migrated or died, income is found to be significantly increased by pension payments.

viii. Finally, in contrast to urban areas, rural poverty analysis in Brazil continues to be greatly constrained by the scarceness of adequate data (“miseria estadistica”). Particularly constraining is the scarceness of adequate household income data in rural areas. For instance, the absence of comparable inter-temporal data (unlike some countries in the region) currently precludes an analysis of how the poverty profile and determinants have changed over time. Moreover, data limitations precluded computing estimates of the number of rural poor that could be assisted via each of the five strategies—this should be a priority in follow-up work. This report draws primarily on two household survey data sets fielded in 1996: the Pesquisa Nacional por Amostra de Domicílios (PNAD) data and the Pesquisa sobre Padrões de Vida (PPV) survey implemented by the Instituto Brasileiro de Geografia e Estatística (IBGE) based on the World Bank’s LSMS survey design. Both data sets suffer from strengths and weaknesses. Consequently, the preliminary expenditure based spatially disaggregated poverty profile presented in this report could be produced only by employing very recently developed small-to-large survey imputation techniques.

A FIVE-PRONGED STRATEGIC FRAMEWORK FOR RURAL POVERTY REDUCTION

ix. The main findings emerging out of this new and more detailed rural poverty profile essentially reveal an overall pattern of pronounced heterogeneity in welfare indicators and income sources among the rural poor in Brazil. Consequently, the proposed rural poverty reduction strategy is framed in terms of an integrated set of policies that provide multiple paths out of poverty tailored to the heterogeneous cross-section of poor rural household groups. A five-pronged poverty exit paths approach is envisaged:

1. AGRICULTURAL INTENSIFICATION OF THE SMALL FARM SECTOR

x. Agricultural policy geared towards small-scale low productivity farms should be viewed primarily as part of a poverty reduction strategy as opposed to an agricultural growth program per se. In the NE, there are opportunities for developing viable full-time small-farm activities, typically comprising a combination of subsistence and market production. The crucial policy areas are rural land and finance market reform, increasing R&D and technological transfers, supplying public goods, and building up social capital. A key finding in the context of this potential poverty exit path is that returns to farmland are highly dependent on the levels of complementary productive (e.g., purchased inputs, machinery, etc.) and demographic factors (e.g., age of operator, education, etc.). Consequently, for land to have a large productivity and revenue increasing impact in farming, it appears necessary to simultaneously improve the levels of other factors such as purchased inputs and machinery. This reinforces the need for an integrated policy framework that recognizes these synergies and brings them into play.
Approximately 85% of the total estimated poor in the rural NE and SE (about 8.3 million people) are found among farm households located in remote, isolated, sparsely populated and low productivity areas, for whom income from farming and agricultural labor represents approximately 70% of their total household income. What must be further examined at this stage is how big the subset of this target group is that could effectively pursue this poverty exit path.

2. A More Dynamic Commercial Agricultural Sector

xi. A revitalized commercial agriculture sector could increase employment and reduce rural poverty directly by absorbing wage labor and indirectly via growth of the downstream processing industry. For example, efficient, market-driven expansion of irrigated areas in the Northeast can create new opportunities. Critical for growth and increased employment in the sector are improvements in the workings of the factor markets, labor, water, land, and capital. From the perspective of the poor, better education levels and reform of the labor code will increase the chances of finding employment in the commercial agriculture sector. Finally, given that the commercial agricultural sector is produces the bulk of Brazil’s export crops, avoiding real exchange rate appreciations, sharp interest rate fluctuations, and a trade policy regime that moves towards relatively low tariffs on importables (of both inputs and final products) could significantly improve the sectors international competitiveness which would in turn lead to greater real wages rates and increased employment opportunities—both on-farm and downstream processing and transport.

3. Stimulating Rural Non-Farm (RNF) Sector Growth

xii. An expanding RNF sector could increase rural employment, especially in the food processing and service sectors, and thus reduce poverty. However, this strategy is likely not to be feasible for the bulk of the poor who live in remote, low density, and poorer rural areas. Overall, the evidence for Brazil and other countries in the region suggests that greater RNF is found in areas that are better served by roads, electricity and communications. In other words, RNF is concentrated in areas where factor and product markets work better and transaction costs are lower. This typically implies that they develop in proximity to urban areas. Furthermore, evidence was found suggesting that: more schooling and access to such infrastructure significantly increases the likelihood of high-return versus low-return RNF employment; RNF employment is less important in the rural NE compared to the SE; and that while women are particularly highly represented in the RNF sector, they are typically employed in the low-return activities (e.g., domestic services). The critical ingredients to stimulate the development of a vibrant rural non-farm economy are better education levels, good basic infrastructure, building up social capital, and well functioning labor and credit markets.

4. Migration of the Young

xiii. While analytical work on the migration process per se (i.e., on the determinants of migration) and the consequences of migration for the rural population in Brazil were beyond the scope of the current study, migration into urban areas and rural towns seems inevitable and even desirable, considering the high incidence of rural poverty, the extremely large absolute number of very small farms combined with the rather largish average household size, and the relatively low agricultural growth potential in the vast areas of dry and semi-dry non-irrigated farmland in the Northeast. The findings in the current study suggest that the determinants of migration in Brazil need to be better understood and analyzed by explicitly incorporating the heterogeneity among the poor rural households (e.g., in terms of age, education, gender, liquid capital and the distance to promising job opportunities). The lack of a time series data set with reliable income and
household characteristics data is a major limiting factor explaining the scarcity of such empirical analysis in Brazil. Despite the current scarcity of empirical analysis of migration determinants in Brazil, both descriptive findings in Brazil and the experiences in other countries provide some pointers for further research and the policy agenda.

xiv. Income differentials are the single largest driving force explaining migration rates. Wage differentials and labor productivity ratios typically suffice to explain the majority of migration rates among landless agricultural workers. However, the bulk of the rural poor in the NE are small farmers and to analyze the migration process for this group one must account for other income sources (e.g., returns to capital), which is more often than not difficult because of data availability and reliability constraints. There are certain income sources, land for instance, that are not fully transferable when migrating. This raises the possibility of strong interactions between the land market and the migration process. Potential migrants, especially poor ones, generally want to take all of their capital along. In the case of farmers this would require the sale of agricultural specific physical capital and land. The lack of land titles and a well functioning land market would impede selling land at a price that reflects its economic value to the operators.

xv. A second factor constraining migration is the agricultural-specific human capital (e.g., skills and experience in farming generally acquired on a learning-by-doing basis) that is not valued at comparable returns outside the agricultural sector. This is especially problematic for older potential migrants since not much can be done to relax this constraint. This underscores the importance of investing in the education of the currently young rural generation and endeavoring to endow them with basic levels of non-sector specific human capital. More training and educational opportunities for the rural poor appear to be the most critical policy variable for facilitating this absorption into other sectors of the economy. Migration will benefit not only the migrant but in many cases also household members who stayed in rural areas via remittances.

5. **SAFETY NET PROVISION FOR THOSE “TRAPPED” IN POVERTY**

xvi. There is a group of rural poor that will not be able to benefit from opportunities in commercial agriculture, from small-scale intensification, or from migration. Members of this group are typically older, often widows, and occasionally farm workers in poorly endowed areas. This group is “trapped” in extreme poverty with no viable future in agriculture beyond subsistence. Members of this group face considerable barriers in finding off-farm employment. For this group, a social safety net, for instance in the form of pensions, is critical to ensure a basic decent living standard. A key design challenge of safety net programs lies in also making them administratively accessible for the rural poor living in remote, low population density areas characterized by high rates of illiteracy.

xvii. In addition to recognizing the multi-dimensionality of potential poverty exit paths and policy options, the strategic framework for action should also recognize intergenerational facet of rural poverty. Hence, parallel efforts to reach the young (especially in the poorest households and in those that are heavily dependent on safety net provisions) via education is critical to provide them with the opportunity of breaking out of the vicious cycle in which their elders are trapped.

**A TENTATIVE PORTFOLIO OF INTEGRATED RURAL POVERTY REDUCTION POLICIES**

xviii. Canalizing a large and heterogeneous group of rural poor into the poverty exit path suitable to each is challenging task that requires the design and implementation of an integrated policy portfolio. The matrix below summarizes the tentative set of policy options identified in this
reported and serves to highlight core policies, the cross-cutting nature of several policies (i.e., important in the context of multiple poverty exit paths), and the synergistic nature of certain policies (i.e., policies that are mutually reinforcing when implemented simultaneously). The synthesis chapter contains a more detailed description of these policy options and how these are interwoven into the five-pronged poverty exit paths strategy.

### A Strategic Framework for Action: A Tentative Set of Integrated Policy Options

<table>
<thead>
<tr>
<th>Poverty Exit Path</th>
<th>Policy Typeology</th>
<th>Increase incomes via small farm sector intensification</th>
<th>Improve farm employment opportunities in dynamic commercial agriculture</th>
<th>Stimulate growth of the RNF sector</th>
<th>Migration of the young</th>
<th>Safety net provision for those &quot;trapped&quot; in poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving human capital endowments</td>
<td></td>
<td>Moderate long-run effect on returns from farming</td>
<td>Moderate effect on returns from farming (e.g., managerial skills) but limited for wage laborers.</td>
<td>Critical to facilitate employment, especially in high-return activities and/or entrepreneurial activities</td>
<td>Essential to enable opportunity-driven migration via education and investing in non-farm specific human capital</td>
<td></td>
</tr>
<tr>
<td>Rural land market reform</td>
<td></td>
<td>Crucial for increasing small farms beyond poverty threshold and enable rentals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing R&amp;D and transfer of technology</td>
<td></td>
<td>Significant positive effects on returns from farming</td>
<td>Significant positive effects on returns from farming</td>
<td>Limited role for public policy</td>
<td>Limited direct impact</td>
<td></td>
</tr>
<tr>
<td>Rural finance market reform</td>
<td></td>
<td>Crucial to relax currently binding credit constraints</td>
<td>Crucial to relax credit constraints</td>
<td>Crucial to relax potential credit constraints</td>
<td>Limited direct impact</td>
<td></td>
</tr>
<tr>
<td>Rural labor market reform</td>
<td></td>
<td>Limit direct impact</td>
<td>Important for farm workers</td>
<td>Important for RNF employment</td>
<td>Improves the integration between the rural and urban labor market</td>
<td></td>
</tr>
<tr>
<td>Supply of public goods and building of social capital</td>
<td></td>
<td>Important to improve productivity and market access</td>
<td>Critical to improve productivity and market access</td>
<td>Important to improve RNF growth, productivity and market access</td>
<td>Important to improve integration between rural and urban areas</td>
<td>Limited direct impact</td>
</tr>
<tr>
<td>Price and trade policy</td>
<td></td>
<td>Impact depends on level of tradables (inputs and output) and typically this sector produces non-tradables.</td>
<td>Avoiding real exchange rate appreciation and sharp interest rate fluctuations are critical policy elements that will contribute to strengthen the competitiveness of the agricultural tradable sector (outputs and inputs); both on-farm and in downstream off-farm sectors. Together with relatively low tariffs on importables (inputs and final products) this should enhance the export orientation of the sector.</td>
<td></td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
</tr>
<tr>
<td>Transfer programs</td>
<td></td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Crucial for groups (e.g., the elderly) &quot;trapped&quot; in poverty and are not benefiting from other policies</td>
</tr>
</tbody>
</table>

### Synergistic Policies

### Core Policies
INTRODUCTION

1. This report constitutes a step towards the objective of designing an integrated strategy for rural poverty reduction in Brazil. The report contains an updated and more detailed profile of the rural poor in the northeast (NE) and southeast (SE) of Brazil; identifies key determinants of rural poverty in these regions; and proposes a strategic framework in which to couch a set of integrated policies that could effectively help to reduce rural poverty in Brazil. The need for an integrated set of policies arises foremost because of the heterogeneous nature of the rural poor in Brazil. No single simple remedy for rural poverty reduction in Brazil could be identified and consequently, an integrated policy approach that provides multiple paths out of rural poverty tailored to key characteristics distinguishing various household groups emerges as more effective alternative.

2. Designing effective rural poverty reduction programs in a large and diverse country such as Brazil is difficult in a vacuum with respect to knowledge of a disaggregated rural poverty profile. Accordingly, a first key objective of this project was to update and improve data pertaining to the state of rural poverty in the northeast (NE) and southeast (SE) of Brazil. This new rural poverty profile disaggregates across two principal dimensions: household income sources and geographical location. On the one hand, rural poverty estimates where disaggregated according to three key income categories: farmers, landless agricultural workers, and Rural Non-Farm (RNF) workers. On the other hand, poverty estimates where spatially disaggregated to cover the regional (i.e., NE versus SE) and state levels, and according to the degree of urbanization over a spectrum ranging from metropolitan to remote rural areas. In addition to providing new and disaggregated facts regarding rural poverty in the NE and SE of Brazil, this exercise has also identified remaining data and knowledge gaps.

3. We start with an overview of the main findings and present the proposed strategic framework for rural poverty reduction in the NE and SE of Brazil that emerged from this project. A 5-pronged rural poverty exit paths approach is introduced followed by a discussion of the envisioned policy portfolio. This policy portfolio is interwoven with the five poverty exit paths and synthesized in a strategy matrix. Finally, the methodology and results from a preliminary policy portfolio selection analysis are presented. The proposals in this report emerge from an analysis of rural poverty determinants and an examination of these from a policy vantage point. This study was complemented by seven in-dept thematic studies that bear on critical components to move towards the formulation of an integrated rural poverty alleviation strategy: (i) the dynamics of the Brazilian small farm sector, (ii) rural labor markets, (iii) rural land markets, (iv) RNF employment, (v) rural education, and (vi) rural pensions. This analysis, together with an evaluation of relevant current public programs, underlies the proposed strategic framework of policy options aimed at reducing rural poverty in the NE and SE of Brazil.

A PROFILE OF RURAL POVERTY: UPDATED FACTS AND NEW FINDINGS

4. Rural poverty reduction in Brazil remains a substantial challenge. Contrary to popular opinion, poverty in Brazil is currently not an overwhelmingly urban phenomenon. In fact, despite migration trends and the considerable larger urban population, poverty remains so widespread in rural areas that a preliminary conservative estimate suggests approximately 43% of the poor population in the NE and SE of Brazil is rural (Table 1), i.e., the standard of living of some 9.8
million people in the rural NE and SE is estimated to be below the poverty line. Moreover, poverty is also found to be typically deeper in rural areas.

### Table 1. Rural and Urban Poverty Incidence in Brazil (NE and SE)

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Total</th>
<th>% Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>23,931,137</td>
<td>88,797,554</td>
<td>112,728,690</td>
<td>21.2%</td>
</tr>
<tr>
<td>Population in poverty</td>
<td>9,812,557</td>
<td>12,844,435</td>
<td>22,656,992</td>
<td>43.3%</td>
</tr>
<tr>
<td>Poor as % of population</td>
<td>41.0%</td>
<td>14.5%</td>
<td>20.1%</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Preliminary estimates from Lanjouw, Chapter 7, Volume 11.*

5. **The incidence of rural poverty is highest in the northeast of Brazil.** Our findings confirm that, as reported in previous studies (e.g., World Bank, 1995), poverty continues to disproportionately affect the northeast (NE). The headcount index is estimated to be about 49% in the rural NE versus 24% in the southeast (SE). While the regional difference between the NE and SE was previously known, the overall magnitude of rural poverty in Brazil remains larger than commonly thought. Moreover, urban poverty in the northeast is also disproportionately higher. None withstanding these results, the importance of poverty estimates lies not per se in specific numbers, but rather in the identification of the most deprived groups. This is borne out by previously unavailable estimates via further disaggregation over both detailed geographical and income-group categories.

### Table 2. Disaggregated Rural and Urban Poverty Incidence in NE and SE Brazil

<table>
<thead>
<tr>
<th></th>
<th>NE</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>Population</td>
<td>16,335,965</td>
<td>29,318,906</td>
</tr>
<tr>
<td>Population in poverty</td>
<td>8,002,241</td>
<td>9,022,559</td>
</tr>
<tr>
<td>Poor as % of population</td>
<td>49.0</td>
<td>30.8</td>
</tr>
</tbody>
</table>

*Source: Preliminary estimates from Lanjouw, Chapter 7, Volume 11.*

6. **Rural poverty disproportionately affects the northeastern states of Brazil.** This is revealed by state-level poverty estimates (Figure 1). The incidence of poverty rises over 45% in the northeastern states of Maranhão, Piauí, Ceará, Alagoas, and Bahia versus less than 20% in the southeastern states (with the exception of Minas Gerais). Moreover, even within the northeast, the overall impression is one of considerable geographical (and presumably agro-climatic, though this level of disaggregation was not feasible due to current data constraints) diversity regarding the incidence of poverty.

7. **Rural poverty is essentially concentrated among farm households located in remote areas.** This finding emerges from a previously unexplored geographical disaggregation of the preliminary poverty estimates across a more detailed locational spectrum ranging over seven categories from densely populated metropolitan urban areas on one extreme to remote and sparsely populated rural areas on the other (Table 3). Of the total estimated number of rural poor in the NE and SE, about 83.6% and 90.3% respectively reside in remote, isolated, sparsely populated and low productivity areas referred to as “rural exclusive” areas (defined as areas that do not meet any of the criteria defining a rural agglomeration; e.g., little or no infrastructure, few

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1 A poverty profile at the levels of disaggregation presented in this report was previously unavailable. Details regarding the estimation procedures are presented in Volume II by Romano (Chapter 1) and Lanjouw (Chapter 7), and are summarized in the background studies section in this Volume.
Permanent structures, and low population density). The group of approximately 8.3 million poor people represents about 85% of all rural poor in the NE and SE of Brazil emerges rather clearly as a primary concern from a rural poverty reduction policy perspective. Preliminary estimates further suggest that for these households, income from farm related activities (farm and agricultural labor) represents no less than two thirds of total household income from all sources and that their principal income source is generated via small-scale farming and/or farm work.

Figure 1. State-Level Rural Poverty Distribution Based on Monthly Individual Expenditures in the NE and SE of Brazil

Source: Based on preliminary estimates reported by Lanjouw. Chapter 7, Volume II.

8. **Regardless of region, non-agricultural workers comprise the relatively better-off group.** This revealing facet of rural poverty in Brazil becomes evident from a classification of the rural population into three groups—farmers, agricultural workers, and non-agricultural workers—according to their main income source. On the one hand, farm workers have the highest extreme headcount poverty measures (59% in the NE and 27% in SE). On the other hand, rural non-farm workers are characterized by extreme poverty measures of about half this magnitude (25% in NE and 15% in SE). Regardless of region, those that receive their main income via farming or farm labor are consistently the poorest group, whilst non-agricultural workers comprise the better off group (see Romano, Chapter 1, Volume II).

2 For further background, definitions and results, see Lanjouw, Chapter 7, Volume II.
Table 3. Locationally Disaggregated Poverty Incidence in NE and SE Brazil

<table>
<thead>
<tr>
<th>Location</th>
<th>NE</th>
<th></th>
<th>SE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor as % of pop.</td>
<td>Population in poverty</td>
<td>Poor as % of pop.</td>
<td>Population in poverty</td>
</tr>
<tr>
<td>Urban metropolitan area</td>
<td>30.8</td>
<td>9,022,559</td>
<td>29,318,906</td>
<td>6.4</td>
</tr>
<tr>
<td>área urbanizada</td>
<td>18.6</td>
<td>1,575,835</td>
<td>8,472,231</td>
<td>4.9</td>
</tr>
<tr>
<td>área não urbanizada</td>
<td>35.7</td>
<td>7,375,228</td>
<td>20,658,902</td>
<td>7.9</td>
</tr>
<tr>
<td>área isolada</td>
<td>36.9</td>
<td>52,993</td>
<td>143,612</td>
<td>18.2</td>
</tr>
<tr>
<td>Rural extensão urbana</td>
<td>46.0</td>
<td>1,167,745</td>
<td>2,538,576</td>
<td>24.4</td>
</tr>
<tr>
<td>povoado</td>
<td>15.9</td>
<td>114,061</td>
<td>717,365</td>
<td>9.6</td>
</tr>
<tr>
<td>núcleo</td>
<td>31.8</td>
<td>25,468</td>
<td>80,088</td>
<td>n/a</td>
</tr>
<tr>
<td>exclusive</td>
<td>51.5</td>
<td>6,694,967</td>
<td>12,999,936</td>
<td>24.7</td>
</tr>
<tr>
<td>Total</td>
<td>37.3</td>
<td>17,024,800</td>
<td>45,654,870</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Source: Preliminary estimates from Lanjouw, Chapter 7, Volume II.

9. **Poorer rural households are more dependent on agricultural wages and labor markets.** For the poorest 20% of families in the rural NE, labor income represents 23.6% of their total household income (22.2% in SE), compared to only 3.8% for high-income families (17.4% in the SE). Income from farming is more important as a source of household income in the NE, where it reaches almost 50% of total income (see Romano, Chapter 1, Volume II). For rural households that are poor in the NE, income from farming and from agricultural labor represents approximately 70% of total household income (53.4% and 16% respectively). In the SE this figure is 62.3%.

10. **The bulk of the rural poor in the NE are small farmers.** About 50% of all farms in Brazil are smaller than 10 hectares (IBGE, 1996). In the NE, farmers in the lowest income tercile group live in extreme poverty (annually below R$781 per capita) and operate plots of 5.1 hectares on average. Even northeastern farmers in the mid-income tercile group still live in poverty (annually less than R$1,562 per capita) and operate on average plot sizes of 7.9 hectares. In the SE, while farmers in the lowest income tercile group operate plots of 16.3 hectares on average, their income remains substantially below the extreme poverty line (see Romano, Chapter 1, Volume II). In total numbers in the NE, small farmers constitute the largest poorest group followed by farm workers.

11. **Rural Non-Farm (RNF) employment is growing, but is still relatively unimportant for the rural poor because location matters.** RNF employment in Brazil is growing faster than agricultural employment (3.6% versus −2.4% between 1992-98). However, RNF income continues to represent only a small fraction of household income for the poorest families. For the majority of the rural poor in the NE, rural non-farm income contributes only 14.7% (16% in the SE) to total household income. The share of income from RNF activities increases with income in both the NE and SE, indicating that better-off households are more dependent on RNF income sources. Headcount poverty estimates are lower in rural areas directly adjacent to, but not formally incorporated into the urban perimeter of municipalities; in fact, in the NE poverty in

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these adjacent areas is lower than in urban areas. RNF income is concentrated in the relatively more urbanized areas, it is less important in the NE compared to the SE, and within the NE its incidence is higher in certain states including Bahia, Maranhão, Rio Grande de Norte. Because the bulk of the rural poor (85%) live in "rural exclusive" areas, the possibilities to increase income via local RNF employment appear limited.

12. **Public pensions are the main source of non-labor income.** Public pensions are by far the main source of non-labor income (about 95%) with an average proportion of total income from public pensions of 15% in the SE and 18% in the NE. The mid-income quintiles have the highest proportion of families receiving pensions, as well as the highest proportion of pensions in total household income. Pension income represents a higher proportion of income for households headed by women (the average age of which is quite high, at around 41 years), on average reaching 50% in the NE, while agricultural workers receive a strikingly low proportion of income from public pension (12% in the NE and 4% in the SE). It should be noted though that pension income in the PPV data above includes pension income from all sources, not just from the Previdência Social in rural areas. The latter provides one minimum wage per month per beneficiary, regardless of income status, and thus it is well targeted considering that it contributes with a relatively higher proportion of household income for the poorest families.

13. **The rural poor in Brazil are worse off in terms of demographics, access to and quality of services.** Vis-à-vis poor households in urban areas, the rural poor tend to have less access to services (e.g., electricity, safe water, and health care), more children, and worse health indicators. Overall, the trends are quite similar for the NE and SE. In terms of demographic characteristics, average family size is higher among the poor and is greatest in the NE, especially among farmers. Larger families seem to perpetuate poverty, since school attendance is typically negatively correlated with family size. Access to services is limited especially in the NE. For instance among the lowest income quintile group, only about 43% in the NE have access to electricity (63% in the SE). Moreover, only 2% of poor farms received some form of technical assistance, compared to 31% of non-poor farmers and subsidized credit follows a similar pattern, with small farmers receiving practically none.

14. **The rural poor in Brazil are also worse off in terms of educational achievement, access and quality.** Illiteracy in the NE is strikingly high, and higher than in other lower income countries in the region. Among the poorest 20% of households in the NE, 75% of the household heads are illiterate, 62% of all household heads and 51% of all family members above 10 years old are illiterate. Agricultural workers, the group characterized by the highest poverty incidence, have an exceptionally high rate of illiteracy (81% among households heads). Younger generations appear to have enjoyed somewhat better access to education, however the NE lags considerably behind the SE in this respect. Regarding quality of education, consider that in the rural NE, 27% of teachers have incomplete primary education and 26% of schools do not have sanitation infrastructure. Furthermore, rural education essentially continues to be a 1st to 4th grade affair. The first four grades accounted for 85% of enrolled rural children in 1998, as opposed to 50% for Brazil as a whole. Repetition rates are higher in the NE and rural students from the region also perform the worst in terms of standardized test scores. A key emerging question is whether the 400,000 children in the rural NE that were not enrolled come mainly from those poor semi-subsistence farming households with access problems or whether these were simply children that tired of repeating and dropped out of school. There is a major knowledge gap regarding the

*Adding another dimension, at the recent IPEA workshop in Rio, Jose Eli de Veiga argued that areas dominated by family-size farms experienced higher RNF employment growth compared to those where larger scale farming ("agricultura patronal") is predominant.*
appropriate mix of demand-side programs such as Bolsa Escola, universal programs such as FUNDEF, and specific rural education programs to bring rural education up to at least the urban areas levels.

15. **Aging of small farmers and the relatively high proportion of female-headed rural households are important factors to consider in the context of safety net policies.** The average age of the head of household in small farms is high and there appears to be a strong relationship between aging, productivity and poverty in small farms. For the subset of poor small-scale farmers that are old, this raises a number of policy issues, such as the viability of exiting poverty via farming, and it reinforces the importance of providing social safety nets such as the Previdência Social. Women household heads represent an approximate 15% of all rural households in the NE (12% in SE) and this proportion increases to the strikingly high level of 30% among all non-agricultural rural households (20% in the SE). It was found that in households where husbands migrated or died, income is significantly increased by pension payments.

16. **The rural-urban migration trend from the NE will continue.** The study identifies five different major trends in rural-urban migration indicators for Brazil during the 1950-1990s. Major waves of rural-urban migration took place from the NE region during the 1950s-70s in response to wage differentials. During the 1990s a new pattern emerged with the stabilization of migration trends and the appearance of RNF employment opportunities, particularly in the South. Projecting towards the next 15 years, recent research in projecting future rural-urban migration flows suggests that a stabilization of urbanization rates will take place in the South, SE and Center West, but the North and NE will continue to be the main source of rural migrants. Improvements in the provision of education and a selective revision of the labor code should increase the prospects of formal employment both in urban and in rural areas.

17. **In contrast to urban areas, rural poverty analysis in Brazil continues to be greatly constrained by the scarceness of adequate data ("miseria estadística").** Particularly constraining is the scarceness of adequate household income data in rural areas. For instance, the absence of comparable inter-temporal data (unlike some countries in the region) currently precludes an analysis of how the poverty profile and determinants have changed over time. This report draws primarily on two household survey data sets fielded in 1996: the Pesquisa Nacional por Amostra de Domicílios (PNAD) data and the Pesquisa sobre Padrões de Vida (PPV) survey implemented by the Instituto Brasileiro de Geografia e Estatística (IBGE) based on the World Bank's LSMS survey design. Both data sets suffer from strengths and weaknesses. While, the PPV reports quite detailed consumption expenditure data and permits the construction of price indices to account for spatial price variables, the sample size is not large enough to be representative at levels of spatial disaggregation much below the regional and large metropolitan area level. The PNAD sample is substantially larger than the PPV and is representative at the state level; but, alas, the PNAD does not report expenditure data and the income measures in rural areas are rather unreliable. Consequently, the preliminary expenditure based spatially disaggregated poverty profile presented in this report could be produced only by employing very recently developed small-to-large survey imputation techniques (See Lanjouw, Chapter 7, Volume II).
A STRATEGIC FRAMEWORK FOR RURAL POVERTY REDUCTION

18. The main findings emerging out of this new and more detailed rural poverty profile reveal an overall pattern of pronounced heterogeneity in welfare indicators and income sources among the rural poor in Brazil. Consequently, the proposed rural poverty reduction strategy is framed in terms of an integrated set of policies that provide multiple paths out of poverty tailored to the heterogeneous cross-section of poor rural household groups. A five-pronged poverty exit paths approach is envisaged: (a) intensification of the small farm sector to increase income from farming; (b) a dynamic commercial agricultural sector that provides increased farm employment opportunities; (c) stimulating growth of the Rural Non-Farm (RNF) sector; (d) migration of the young, especially those from remote, low density, and low productivity rural areas; and (e) provision of a safety net for those “trapped” in poverty. This study has identified a tentative set of integrated policy instruments that could be implemented to facilitate one or more of these five poverty exit paths.

19. This tentative set of policy options was identified via an analysis of rural policy determinants. Measuring poverty and assessing where the problem is greatest is a crucial first step, but designing an effective anti-poverty policy also requires uncovering the determinants of poverty. This analysis was further complemented with an evaluation of relevant current public programs and six in-depth thematic studies that bear on critical components of the proposed integrated policy approach aimed at reducing rural poverty in the NE and SE of Brazil: (a) the dynamics of the Brazilian small farm sector, (b) rural labor markets, (c) rural land markets, (d) RNF employment, (e) rural education, and (f) rural pensions. Before turning to a discussion of the five exit strategies, the analytical findings, and the proposed set of integrated policy instruments, a note regarding the macroeconomic environment in Brazil is warranted.

20. While this study emphasizes primarily microeconomic events—such as the impact of schooling, income transfers, and access to land and credit—poverty reduction requires both economic growth (macro-level) and specific anti-poverty policies (micro-level). In Latin America, overall economic growth has proven important for poverty reduction. An increasing body of empirical evidence shows that under faster overall growth (5% or more) the incomes of the poor have risen significantly. Specifically in Brazil, where agriculture represents less than 10% of GDP and about 23% of employment, fast-growing employment in urban areas and expansion in domestic demand for farm products that would result from fast growth in the overall economy—particularly for small farmers producers of non-tradables—can go a long way in reducing rural poverty, even if the agricultural economy does not grow very fast. Essentially, achieving a significant, sustained, and politically viable reduction in rural poverty without rapid overall economic growth would be quite difficult in Brazil.

21. Finally, primarily because of data and time constraints, the coverage of this report is not exhaustive. Some of the potentially important issues in a poverty reduction context that could not be covered include: (i) the impact of commercial agricultural policies, (b) the effect of overall government programs in rural areas that are not poverty focused per se (e.g., programs such as PRONAF of which about 25% of beneficiaries were rural poor), and (c) the often complex and important environment-poverty inter-linkages. Also, by way of reiterating, due to household level data constraints, this report covers only the NE and the SE regions of Brazil. Thus, while the bulk of the rural poor live in the latter regions, the issues addressed and the tentative strategic framework for rural poverty reduction might need to be somewhat adapted in other regions.

5 See for instance Morley (1995) for Latin America and, for a larger sample of developing countries, see the recent work by Dollar and Kraay (2000).
RURAL POVERTY EXIT PATHS: A 5-PRONGED APPROACH

AGRICULTURAL INTENSIFICATION OF THE SMALL FARM SECTOR

22. A large proportion of poverty in Brazil is confined to rural areas and a large segment of these rural poor are small farmers. Thus, if we can understand the major economic trends that are affecting the small farm sector in Brazil, then we should understand a great deal about the economic trends that are affecting many of the poor in Brazil. Market developments and government policies since the late 1980s appear to have reinforced the sector’s disposition towards technologically advanced producers and against low technology, small and semi-subsistence farmers.6

23. Openness to trade, deregulation of domestic marketing, the reduction in subsidized credit programs, a new production technology with more intensive use of purchased inputs, the restructuring of the agri-food processing and marketing industries (vertical integration) are all factors that have favored the technologically more advanced commercial producers better able to cope with price and yield variability, and with the more demanding requirements from agro-processors (higher volume and quality standards). Trade liberalization and deregulation had a major impact on the output mix and intensification of agriculture. Simultaneously with a decline in the domestic price of import-competing products, lower trade barriers induced a significant decline in the domestic price of purchased inputs. However, the low technology and subsistence farmers, now also exposed to the lower output prices, could not benefit as much from the lower price of inputs. From an intra-regional perspective, market liberalization has triggered major geographic shifts in the location of production, reallocation of resources away from the southeast region into more capital-intensive and larger scale agriculture in the center-western region.

24. How to assist small farmers with potential to survive without quasi-permanent subsidies in the more competitive policy environment of today—quite different from that in the 1960s through most of the 1980s—is a major issue in Brazil today. From the vantage point of poverty reduction, the most difficult challenge arises in the semi-arid regions of the Northeast. As emphasized before, the bulk of the rural poor live in low density, remote areas and continue to depend on agriculture as their main source of income—either via farming or labor. Unfortunately, it is precisely in these areas where agriculture is contracting. In this context, two main thrusts that could drive agricultural public programs would include:

- Reducing the gap in productivity and returns by investing in technologies tailored to the needs of those poor small-scale farmers with productive potential; and

- Reducing the transaction costs in agricultural markets by improving for instance, transport infrastructure, technical assistance, access to credit, and farmer organizations.

25. Agricultural policy geared towards small-scale low productivity farms should be viewed primarily as part of a poverty reduction strategy as opposed to an agricultural growth program per

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6 In their recent study, S. Helfand and G. Castro de Rezende (2000) also conclude that combined effect of the various reforms, including the currency appreciation, have had a differential impact related to farm size. Their study documents the dramatic adverse price effect for producers of some products, such as wheat and milk, in contrast to positive price effects on exportables. Most of the gains were concentrated in the Center-West, while most of the difficulties occurred in the South.
se. In the Northeast, there are some opportunities for viable full-time small-farm activities, typically comprising a combination of subsistence and market production. Capitalization, physical investments, and services for family farmers can increase labor productivity and incomes and reduce migration pressures. These programs include intensification through for instance improved technical assistance, community-based land reform, and small infrastructure investments such as access roads. Where such investments are efficient and where the underlying economic activity is viable, they should be supported. However, this strategy applies only to a subset of the small farm sector. For instance, this strategy would be very difficult and expensive to implement in the remote arid and semi-arid regions of the NE where, alas, a significant proportion of rural poor live. Given current data constraints, what remains unclear at this stage is exactly how big this subset is.

26. A critical issue emerging from the analysis in this report is that the returns to assets (including land) are highly dependent on the levels of other complementary assets, including human capital. Consequently, returns differ significantly depending on the size of farms, and some underlying constraints—but not all—can be resolved by public policies. A key message from this analysis is the importance of a "package" approach—i.e., a package of policies that accounts for the synergies between access to the various assets.

MORE DYNAMIC COMMERCIAL AGRICULTURE

27. A revitalized commercial agriculture sector could increase employment and reduce rural poverty directly by absorbing wage labor and indirectly via growth of the downstream processing industry. For example, efficient, market-driven expansion of irrigated areas in the Northeast will create new opportunities. Critical for growth and increased employment in the sector are improvements in the workings of the factor markets, labor, water, land, and capital. From the perspective of the poor, better education levels and reform of the labor code will increase the chances of finding employment in the commercial agriculture sector. Finally, given that the commercial agricultural sector produces the bulk of Brazil’s export crops, avoiding real exchange rate appreciations, sharp interest rate fluctuations, and a trade policy regime that moves towards relatively low tariffs on importables (of both inputs and final products) could significantly improve the sectors international competitiveness which would in turn lead to greater real wages rates and increased employment opportunities—both on-farm and downstream processing and transport.

28. When analyzing the trends in the structure of Brazilian agriculture it also useful to draw on the possible relevance of the discussion concerning small farming in the US agricultural sector just a few years ago. The trend in Brazil in light of developments in US and elsewhere suggest

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7 A few years ago the USDA positioned itself among those worried about the possible untenable position of smaller family farms. During a period of remarkable record of productivity growth in US agriculture, technological change in pursuit of trade competitiveness was inducing ownership and control over agricultural assets in fewer and fewer hands. In fact, the largest 25% of farms that accounted for 50% of farm sales in 1940 account for 90% of sales today. However, as shown very recently by Gardner (2000), the economic situation of smaller farms in the US as not worsened. Indeed, considering both farm and off-farm sources, household income of people in smaller farms has improved consistently through time. The story behind this success is one of a rising importance of off-farm income and migration, which highlights the key role of a well-articulated labor market for a better integration between farm and non-farm activities. The analysis finds no evidence that agricultural policies have contributed to the growth of farm household income of small farmers and most relevant for our analysis for Brazil, no evidence that farm productivity and farm size had any effect on the growth or level of farm household income.
that overall agricultural output growth will be driven primarily by the commercial farmers and not by the small-scale farm sector in low productivity areas such as the NE. Thus, this further highlights the dilemma that arises because of the fact that while agricultural income is critical for these small-scale low productivity farms, they are not critical to Brazil's agricultural sector growth as a whole.

**RURAL NON-FARM EMPLOYMENT**

29. Rural non-farm activities are promising to increase rural employment, especially in the food processing and service sectors, and thus reduce poverty. However, this strategy is not feasible for those who live in more remote, low density, and poorer rural areas. Overall, the evidence for Brazil and other countries in the region also suggest that greater RNF is found in areas that are better served by roads, electricity and communications. In other words, RNF is concentrated in areas where factor and product markets work better and transaction costs are lower. In most cases, this implies that they develop in proximity to urban areas. In this study, evidence was found suggesting that more schooling and access to such infrastructure significantly increase the likelihood of a home-based enterprise. RNF employment is less important in the rural NE compared to the SE. The evidence for Brazil also indicates that women are particularly highly represented in the RNF sector—particularly in education and domestic services. The critical ingredients to stimulate the development of a vibrant rural non-farm economy are better education levels and good basic infrastructure.

**MIGRATION OF THE YOUNG**

30. While analytical work on the migration process per se (i.e., on the determinants of migration) and the consequences of migration for the rural population in Brazil were beyond the scope of the current study, migration into urban areas and rural towns seems inevitable and even desirable, considering the high incidence of rural poverty, the extremely large absolute number of very small farms combined with the rather largish average household size, and the relatively low agricultural growth potential in the vast areas of dry and semi-dry non-irrigated farmland in the Northeast. Though descriptive analysis of the principal inter-regional migration trends in Brazil since the 1950s are available (e.g., see Carneiro, Nov. 2000), the findings in the current study suggest the need to go further by estimating for instance migration functions that incorporate the heterogeneity among the poor rural households (e.g., in terms of age, education, gender, liquid capital and the distance to promising job opportunities). The lack of a time series data set with reliable income and household characteristics data is a major limiting factor explaining the scarcity of such empirical analysis in Brazil. Despite the current scarcity of empirical analysis of migration determinants in Brazil, both descriptive findings in Brazil and the experiences in other countries provide some pointers for further research and the policy agenda. Historically, rural-urban migration has been a major factor explaining the reduction rural poverty during the 1990s in most of Latin America. Consequently, as will be expanded on shortly, the need to improve educational levels in rural areas to prepare migrants for a successful absorption in urban and RNF

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8 In their analysis using CEPAL data for nine countries in Latin America, de Janvry and Sadoulet (2000) conclude that the observed reduction in the number of rural poor relative to the number of urban poor in the region was not the result of successful rural development; it was driven by out-migration. They estimate that approximately 68% of the observed reduction in rural poverty during 1990-97 is attributed to rural-urban migration. A recent study by Paes de Barros (2000) examines the relation between the observed fall in rural poverty and conditions in rural labor markets in Brazil.
employment (e.g., higher paying jobs) should be viewed as a fundamental component of Brazil's rural poverty alleviation strategy.

31. Income differentials are the single largest driving force explaining migration rates. Wage differentials and labor productivity ratios typically suffice to explain the majority of migration rates among landless agricultural workers. However, the bulk of the rural poor in the NE are small farmers and to analyze the migration process for this group one must account for other income sources (e.g., returns to capital), which is more often than not difficult because of data availability and reliability constraints. There are certain income sources, land for instance, that are not fully transferable when migrating. This raises the possibility of strong interactions between the land market and the migration process. Potential migrants, especially poor ones, generally want to take all of their capital along. In the case of farmers this would require the sale of agricultural specific physical capital and land. The lack of land titles and a well functioning land market would impede selling land at a price that reflects its economic value to the operators.

32. A second factor constraining migration is the agricultural-specific human capital (e.g., skills and experience in farming generally acquired on a learning-by-doing basis) that is not valued at comparable returns outside the agricultural sector. This is especially problematic for older potential migrants since not much can be done to relax this constraint. This underscores the importance of investing in the education of the currently young rural generation and endeavoring to endow them with basic levels of non-sector specific human capital. More training and educational opportunities for the rural poor appear to be the most critical policy variable for facilitating this absorption into other sectors of the economy. Migration will benefit not only the migrant but in many cases also household members who stayed in rural areas via remittances. Essentially, policy-wise the issue is not one of encouraging an exodus of the rural young nor is it one of artificially keeping people in rural areas. Rather the issue is one of giving the rural young a chance at opportunity-driven migration. In other words, provide them with the ability to respond to potentially better economic opportunities in urban areas or the non-farm sector.

A SAFETY NET FOR THOSE “TRAPPED” IN POVERTY

33. There is a group of rural poor that will not be able to benefit from opportunities in commercial agriculture, from small-scale intensification, or from migration. Members of this group are typically older, often widows, and occasionally farm workers in poorly endowed areas. This group is "trapped" in extreme poverty with no viable future in agriculture beyond subsistence. Members of this group face considerable barriers in finding off-farm employment. For this group, a social safety net, for instance in the form of pensions, is critical to ensure a basic decent living standard. A key design challenge of safety net programs lies in also making them administratively accessible for the rural poor living in remote, low population density areas characterized by high rates of illiteracy. In addition to recognizing the multi-dimensionality of potential poverty exit paths and policy options, the strategic framework for action should also recognize intergenerational facet of rural poverty. Hence, parallel efforts to reach the young (especially in the poorest households and in those that are heavily dependent on safety net provisions) via education is critical to provide them with the opportunity of breaking out of the vicious cycle in which their elders are trapped.
## A Strategic Framework for Action: A Tentative Set of Integrated Policy Options

<table>
<thead>
<tr>
<th>Poverty Exit Path Typology</th>
<th>Increase incomes via small farm sector intensification</th>
<th>Improve farm employment opportunities in dynamic commercial agriculture</th>
<th>Stimulate growth of the RNF sector</th>
<th>Migration of the young</th>
<th>Safety net provision for those “trapped” in poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving human capital endowments</td>
<td>Moderate long-run effect on returns from farming</td>
<td>Moderate effect on returns from farming (e.g., managerial skills) but limited for wage laborers.</td>
<td>Critical to facilitate employment, especially in high-return activities and/or entrepreneurial activities</td>
<td>Essential to enable opportunity-driven migration via education and investing in non-farm specific human capital</td>
<td>Reduces the number that are dependent on safety net income</td>
</tr>
<tr>
<td>Rural land market reform</td>
<td>Crucial for increasing small farms beyond poverty threshold and enable rentals</td>
<td>Limited direct impact</td>
<td>Potentially important impact for farmers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing R&amp;D and transfer of technology</td>
<td>Significant positive effects on returns from farming</td>
<td>Significant positive effects on returns from farming</td>
<td>Limited role for public policy role</td>
<td>Limited direct impact</td>
<td></td>
</tr>
<tr>
<td>Rural finance market reform</td>
<td>Crucial to relax currently binding credit constraints</td>
<td>Crucial to relax potential credit constraints</td>
<td>Crucial to relax credit constraints</td>
<td>Limited direct impact</td>
<td></td>
</tr>
<tr>
<td>Rural labor market reform</td>
<td>Little or no direct impact</td>
<td>Important for farm workers</td>
<td>Important for RNF employment</td>
<td>Improves the integration between the rural and urban labor market</td>
<td>Little or no direct impact</td>
</tr>
<tr>
<td>Supply of public goods and building of social capital</td>
<td>Important to improve productivity and market access</td>
<td>Important to improve productivity and market access</td>
<td>Important to improve RNF growth, productivity and market access</td>
<td>Important to improve integration between rural and urban areas</td>
<td>Little or no direct impact</td>
</tr>
<tr>
<td>Price and trade policy</td>
<td>Impact depends on level of tradables (inputs and outputs) and typically this sector produces non-tradables.</td>
<td>Avoiding real exchange rate appreciation and sharp interest rate fluctuations are critical policy elements that will contribute to strengthen the competitiveness of the agricultural tradable sector (outputs and inputs), both on-farm and in downstream off-farm sectors. Together with relatively low tariffs on importables (inputs and final products) this should enhance the export orientation of the sector</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
</tr>
<tr>
<td>Transfer programs</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Limited direct impact</td>
<td>Crucial for groups (e.g., the elderly) “trapped” in poverty and are not benefiting from other policies</td>
<td></td>
</tr>
</tbody>
</table>

### Synergistic Policies

### Core Policies
AN INTEGRATED POLICY PORTFOLIO FOR RURAL POVERTY REDUCTION

34. Canalizing the rural poor towards their respective applicable poverty exit paths and paving the latter requires implementing an integrated policy portfolio. This section discusses how various current policies fit within the proposed 5-pronged rural poverty reduction strategy and proposes additional complementing policy efforts towards building a more comprehensive framework.

IMPROVING HUMAN CAPITAL ENDOWMENTS

35. More and better education for the rural population should be considered a top priority. Better education will not only increase employment opportunities but will also facilitate opportunity-driven migration—and the latter should be viewed as a pivotal rural poverty reduction path both in the shorter and longer term. Education-based policies should be viewed as a grassroots strategy to provide the young members in rural poor households with the opportunity of breaking out of the vicious poverty cycle in which their elders are trapped. The degree to which human capital endowments of the rural poor working age population can be improved are limited largely to retraining initiatives. Moreover, the opportunity cost of investing in human capital (the income that could be generated if working) is typically much greater for them vis-à-vis their children. Investing in education to endow the younger generations with nonagriculture-specific human capital is key. As the discussion below indicates, the findings on education suggest that the policy challenge is to find an appropriate mix of demand-side programs such as Bolsa Escola, universal programs such as FUNDEF, and specific rural education programs to bring rural education up to at least urban levels.

36. Soares et al. (Chapter 7, Volume II) report a number of salient facts regarding rural education. About 10% of rural school age children are not enrolled and this corresponds to 400,000 kids in the rural NE and 300,000 in the rural SE.\(^9\) Between 1991-98, net enrolment rates increased from 91% to 96% in urban areas and from 75% to 91% in rural areas. While this is an indication of substantial improvement, especially in rural areas, there is also still a lot of room for improvement. The FUNDEF program was instrumental in this improvement, particularly in rural areas in the NE where the largest increases occurred. In 1998, about 85% of rural children were enrolled in the 1st to 4th grade as opposed to 50% for Brazil as a whole, while rural secondary education continues to be virtually non-existent. In 1998, only 6% of 5th to 8th graders in Brazil were rural children and, representing a mere 1% of total enrollment. This means that the coverage of rural education is still predominantly 1st, 4th grade and thus rural education policies should reflect this fact. This implies also that rural schools benefited from the Ministry of Education's emphasis on primary education. The evidence suggests that repetition of grades remains a critical issue in Brazilian education. While the increase in 1st to 4th grade rural enrollment rates reflects improved access to schooling, we are also interested in gauging the progress and achievement once these children are attending classes. Regarding progress, the evidence suggests that repetition of grades remains a critical issue in Brazilian education, especially in rural areas were it is not uncommon for children to repeat the same grade several times.\(^{10}\) Repetition has fallen considerably, but it is still high. Similarly, test score comparisons indicate a significant gap between urban and rural students.

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\(^9\) See Soares et al., Chapter 7, Volume II.

\(^{10}\) Note in this context, that using 'years of education' as a dependent variable in analysis would be problematic.
37. 18% of rural teachers in Brazil are individuals with incomplete primary education (0% in urban areas) and only 5% have completed higher education (28% in urban areas). The rural-urban differences in educational resources are striking. The same gap that exists in teacher qualification also exists in physical (e.g., bathrooms and sanitation) and pedagogical (e.g., library, computers and audiovisual equipment) school infrastructure. For example, in contrast to practically all urban schools, about 30% of rural schools have no sanitation infrastructure. The under-equipment of rural schools is even more striking in terms of pedagogical facilities considering that for instance only 3% have computers (44% in urban) and 7% a library (58% in urban). To the extent that the striking differences in educational inputs is a major factor behind the rural-urban differential, the Ministry’s policy of allocating relatively more inputs to the rural sector should help reduce the observed differential.

38. Regional comparisons of rural education indicators reveal that the NE is consistently worse off. While differences in terms of net enrollment have become negligible in recent years, 90% of these children in the NE are enrolled in the 1st to 4th grades compared to only 68% in the South. Grade repetition is substantially more frequent in the North and Northeast and rural students from these regions also perform the worst in terms of standardized test scores. Likewise, 27% of teachers in the rural NE have not completed their primary education versus only 4% in the South and similar differences also emerge when comparing physical and pedagogical school infrastructure. The EDURURAL, Projeto Nordeste II and III and FUNDECOLA programs have all attempted with varying degrees of success to address this regional differences, but which still remain large.

39. While non-attendance is an issue in both the rural NE and south, quality of education for those who attend in the rural south is not only much better compared to the rural North and Northeast but, in addition, school results in the rural South are not that different from their urban counterparts. For instance, in the South there is practically no difference in the rate of grade repetition between rural and urban schools; likewise with regard to physical school infrastructure. This observed heterogeneity raises a number of important questions in the context of education and its role in the context of a rural poverty alleviation strategy.

40. The key demand-side issue is dealing with non-attendance in rural areas. Essentially, the 10% non-attendance level and the high extend of repetition in rural schools raises the question to what degree these are explained by the household opportunity costs of child labor? To this extend, programs such as Bolsa Escola, PETI (a child labor eradication programs), PNAE (a school lunch program), and PNTE (a school transportation program) could be very relevant by compensating households for this opportunity cost. While Bolsa Escola is often thought of as a single federal program that monetarily compensates households for school attendance, there are actually also a wide variety of various “Bolsa Escola” programs by the states, municipalities and even NGOs.

41. A preliminary evaluation of the Bolsa Escola in Brasilia indicates that the program has been almost 100% effective at keeping kids in school. Unfortunately, a comprehensive review of these programs is not yet available—we recommend that this is undertaken—and thus far the scale at which these programs are currently implemented is still very modest and not widespread. Furthermore, both Campinas and Brasilia (which pioneered the Bolsa Escola programs) are relatively richer areas, and hence the success of the programs in these two areas may not be automatically transposed to poorer areas implementing similar programs. Likewise, PETI despite being very effective is still a very small program. Given the apparent success of these programs,

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11 Soares et al. (Chapter 8, Volume II) provide a description of the various programs.
we recommend that, in the context of possibly expanding these programs, a study be undertaken to understand the household characteristics and determinants associated with non-attendance in rural areas. The key supply-side issue is improving the low quality and assets (teachers and infrastructure) of rural schools. The question this raises is whether this requires just increases in funding or also institutional reform. Implicitly, the position of the Ministry of Education seems consistent with the view that giving comparable access to inputs and other resources, results in rural areas should be similar to those in urban areas. While there is some evidence consistent with that view, the issue requires further analysis.

42. In addition to the programs discussed above, whose approach is universal (including a rural component), there are some programs focused exclusively on rural education. In the FUNDECOLA program there is a subproject called Escola Ativa whose objective is to adapt the Escuela Nueva methodology for multigrade classrooms. Since multigrade classrooms are an almost exclusively rural phenomenon, the fact this program has a strong rural orientation. While it has been tried in few schools only, it may represent a promising development for improving the quality of rural education. Another case is that of EDURURAL, adopted in the 1980s in the NE region, under which many schools were built and equipped, and the equipment in existing schools was improved. Subsequent evaluation of this program showed that the better equipment had a positive albeit limited impact in school performance, suggesting that other factors including management of the school system had perhaps been neglected.

RURAL LAND MARKET REFORM

43. Brazilian agriculture is characterized by an historical pattern of land concentration in which the lion share of the land is owned by relatively small number of large estates (agricultura “patronal”) that coexist with a much larger number of small farms (“familiar”). In 1996, almost 50% of agricultural establishments were smaller than 10 hectares, these comprised only about 2.25% of the total area farmed and 12% of gross farm output in Brazil. By contrast, less than 11% of farms were larger than 100 hectares, but this group accounted for 80% of the total area farmed. During the decade spanning the 1985 and 1996 agricultural census, the number of small farms declined by approximately 700,000 units (total farm land declined by 5.6% during the same period). Management by owner is the predominant tenancy (74% of all farm units) and it is worth highlighting that tenant farmers (share and cash lease) represents a low and declining share, reaching only 11% of all farm units in 1995-96. The remaining 14% are squatters (710,000 in 1995-96).

44. A salient feature in the NE, is the predominance of farms that are simply too small to generate an income level sufficient to lift them above poverty, regardless of how efficiently they produce. For a large proportion of small farmers current farm income is very low. This is not an issue of relative efficiency in resource allocation among small farmers (such as value added per hectare). It is primarily a issue of farming in an environment which is collectively too constrained by size, lack of working capital, distance to markets, lack of access to credit and extension, high risks in production and prices. The latter arise in the context of a far more open economy than was the tradition in Brazil in the past, and continues today in Japan, Taiwan, and Europe. Some estimates suggest that farm returns for approximately 70% of family farms in Brazil are below the minimum wage per worker. For example, just in the State of Ceará there are about 245,000 farms below 10 hectares and this, in the absence of irrigation and of off-farm income, is widely

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considered to be well below the minimum size necessary for farmers to generate sufficient income to be able to exit poverty.  

44. For their analysis of farm revenue determinants, López and Romano (Chapter 6, Volume II) classified farmers in NE and SE into four groups: minifundia (up to 2 ha), small farmers (2.1 to 10 ha), medium size farmers (10.1 to 50 ha) and large farms (50.1 to 2000 ha). They find that the effect of per capita land on per capita farm revenues varies dramatically between these farm size categories. The marginal revenue effect of increasing land is practically negligible for small farms while it becomes greater and significant for medium and large farms. While this finding by itself might be counterintuitive at first sight, because it is a partial elasticity result it is in fact highly informative. In other words, the finding reflects the marginal contribution of land to farm revenues given the level of all other productive factors (e.g., purchased inputs, machinery etc.) and demographic characteristics (e.g., age of operator, education etc.). Thus, there is a synergy between land and the other productive factors that mutually reinforces their productivity and returns. While this result is economically intuitive, it is often overlooked and is another key finding underscoring the importance of pursuing a rural poverty reduction strategy consisting of an integrated policy set. For land to have a large productivity and revenue increasing impact in farming, it appears necessary to simultaneously improve the levels of other factors such as purchased inputs and machinery.

45. The recently designed and implemented community-based approach to land reform is one program concept with flexibility to be tailored in ways that account for these synergies: beneficiary groups negotiate directly with potential sellers of suitable properties, and then obtain financing for the purchase of the land and complementary subprojects and receive technical assistance. Two pilot projects (the Ceará Rural Poverty Alleviation Project and the Cédula da Terra) designed along these lines have been evaluated as successful in terms of speed, cost per family, participation of beneficiaries and anticipated impact (World Bank, 2000). Together these projects have redistributed a total of approximately 640,000 hectares to benefit some 23,700 households—i.e., about 100,000 individuals and an average farm size of 27 hectares—at an average estimated cost of R$10,000 per family (World Bank, 2000). This is a significant achievement and there appears to be considerable scope for further action along these lines. However, in the bigger context of the estimated 9.8 million rural poor in the NE and SE of Brazil, these pilot community-based land reform programs have currently reached only about 1% of the rural poor. Hence, community-based land reform should not be thought of as the panacea for rural poverty reduction but rather as a critical component in a wider set of integrated policies.

46. Essentially, rural poverty can no longer be explained solely according to the land ownership pattern. The declining share of land in the value of production also reflects this. For instance, Brandão et. al. (Chapter 4, Volume II) report dramatic reductions in ratio's of the value of agricultural production to the sale and rental values of the corresponding land stock. These trends are manifestations of the overall trend, especially of the commercial agricultural sector, towards more production methods that require larger proportions of technology, renewable capital and purchased inputs.

47. Is the decline in farmland prices since 1994 permanent or cyclical? The analysis on the evolution of farm land prices distinguishes several episodes since the early 1970s: an increase in real land prices up to 1975, fairly constant prices during 1975-83, unstable and falling prices during 1984-94, and a significant decline since 1994. The decline since 1994, particularly in the

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14 See Brandão, Bastos and Brandão, Chapter 4, Volume II.
south, is attributed to several quasi-permanent factors, namely a consequence of Mercosur with cheaper land in Argentina, Uruguay and Paraguay (land prices in the South are 3 to 4 times higher than in neighboring countries), low rates of inflation, higher interest rates, changes in land taxation, all factors that took away some of the attractiveness of holding land as an investment. What is unclear is the extent to which lower profitability in farming was another influential factor explaining this decline until 1996. Some recovery in land prices after the 1998 devaluation of the Real would be consistent with the profitability argument, but which could not be examined due to lack of data. Lower farmland prices provide a most favorable price environment for the acquisition of land under the current land reform program in the NE. On the other hand, the income potential of the beneficiaries of the land reform would of course be reduced if the reduction in land prices reflects a decline in farm profitability, a variable that should be monitored.

48. Overall, it is somewhat surprising that a country with the level of development of Brazil would be so far behind the modernization of its rural land market. Brazil is characterized by substantial numbers of by and large unprotected sharecroppers and tenants. This is essentially a result of current provisions of the Land Statute, under which tenants (even informal sharecropping arrangements) can claim rights to the land (in some cases even expropriate the farm) when certain conditions are met. In particular, when perennial crops are planted or investments are made. Consequently, landowners typically accept rental or other arrangements on a highly precarious basis providing annual crops are planted and under which there is no legal protection of tenants. The current Land Statute thus constrains the farm sector—especially poor rural landless farmers—by inhibiting more flexible and secure tenancy arrangements. This issue deserves special attention. Agriculture in Brazil, as in most middle-income countries, is becoming more capital intensive and more exposed to foreign markets; hence the critical role of flexible tenancy arrangements that facilitate farm restructuring, the entry and the exit of farmers.

49. Land rentals should be seen as an important complement to the land reform program currently being implemented. The land reform program alone will inevitably not resolve the question of land access for a large fraction of the potential beneficiaries. There is a need to open more opportunities through the land market for small and medium scale labor-intensive farming. The focus of the program recommended in this report could take the form of consolidating property rights by the revision of the land legislation so as to secure longer-term tenancy arrangements, resolution of disputes regarding interpretation and enforcement of land rental arrangements. In addition, the impact of such program would be greatly enhanced by simultaneous adjustments of the labor code and in the land tax system. Labor laws have had an anti-sharecropping bias. In this context, the experience with the Rural Leasing Exchange in the Triângulo Mineiro contains useful lessons. Although not oriented towards social goals, this program has been successful and it represents an approach that should be examined further.

INCREASING R&D AND TRANSFER OF TECHNOLOGY

50. López and Romano (Chapter 6, Volume II) find that in 1996 only about 2% of minifundia and small farmers received some form of technical assistance; rising to 8% and 31% for medium size and large farms respectively. Econometrically estimated income and revenue functions are a powerful tool to capture the interactions between various determinants (e.g., human and physical capital, the policy framework, etc) as well as to reveal to relative impact of changes in the various factors on household income.

51. López and Romano (Chapter 6, Volume II) estimated farm revenue functions and report that policies that increase access to technical assistance would benefit poor and non-poors farmers
alike. The potential for increasing farm revenues of small farmers via increased technical assistance is quite significant. Farmers with access to technical assistance have between 7% and 11% more revenues, ceteris paribus, than those that do not. This increase, while significant, does not however guarantee that the income of these small farmers will necessarily surpass the poverty line. Considering that for instance in the NE, 57% of farmers live in extreme poverty and up to 82% live in poverty; this further underscores the need for a policy approach that is integrated and tailored to accommodate for policy synergies.

**RURAL FINANCE MARKET REFORM**

52. López and Romano (Chapter 6, Volume II) report that of the minifundia (up to 2 ha) and small farms (2.1-10 ha) in the rural NE and SE, on average only 2% received government subsidized credit in 1996. For farms sized between 10.1 and 50 hectares, this proportion rises only to a mere 8%, while on average some 31% of farms that are larger receive government subsidized credit. These descriptive findings are reflective of the degree of access-to-credit problems that were faced by small and poorer farmers in the rural NE and SE. Since 1996, programs such as PRONAF have been expanded substantially and the situation is likely to have improved but updated figures were not available.

53. The need to improve rural finance market functioning is further borne out via the farm revenue determinants analysis by López and Romano (Chapter 6, Volume II). Most notably, for small farmers, the elasticity of purchased inputs is considerably larger than the observed input shares.\(^5\) In other words, the marginal revenue of purchased inputs is higher than their marginal cost in production and this reflects their credit constrained induced sub-optimal allocation of purchased inputs. In the context of the synergy findings between land and other factors of production, this further reinforces the need for an integrated strategy that focuses not only land but also recognizes policy synergies involving other rural factor markets to increase revenues from farming.

54. Low liquidity is thus a very influential constraint for small farmers and without complementary assets (e.g., purchased inputs, machinery, education, etc.), the value of land, by itself is very small. For land to have a large impact on income (revenue) it is necessary that the liquidity constraints faced by small farmers are reduced and this in turn enables the purchase of inputs and more capital for on-farm investments. Relaxing these constraints is within the scope of agricultural policy initiatives. However, note that this does not resolve the consequences of low human capital endowments and the possible output price effect induced by the non-tradability. This implies that for a subset of small-scale poor farmers we might have to consider alternative poverty reduction measures in the form of direct income transfers such as Brazil’s *Previdência rural* and carefully evaluate the potential for programs a la Mexico’s *Pro Campo*.

**RURAL LABOR MARKET REFORM**

55. Labor markets can play a vital role, both directly and indirectly, for rural poverty reduction. In a very direct sense, labor market functioning is key because poor rural households are much more dependent on wage earnings. For example, on average in the rural NE, for poor households labor wages account for 30.6% of total income compared to only 12.6% for the non-poor (see Lanjouw, Chapter 7, Volume II). Flexible, efficient and well-functioning labor markets

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\(^5\) This corresponds to the analysis by de Janvry et al. (1991) whom find that market failures, including lack of access to the credit market, are typically reflected in the elasticities of the responses of small poor farmers to various factors of production.
can also play an important indirect role by facilitating labor reallocation across skills, types of employment, and geographical locations. In the context of the proposed integrated policy framework, labor market functioning is crucial for three of the five poverty exit strategies.

**Reviewing the Labor Code**

56. Labor contract legislation is critical because to a large extent it determines the degree of market flexibility. Agriculture is a special and somewhat difficult case. Agriculture activities are typically beset by considerable variability in both production and prices—and thus parallel fluctuations in labor demand—and are generally further constrained by the need to harvest and process production in a short period of time. Moreover, the sector is characterized by high monitoring costs and seasonal production patterns under typically very heterogeneous employment conditions, even within the same geographic region. Consequently, a labor code that establishes overly restrictive or too many regulations can result in two reinforcing effects: limiting the use of contracts that induce cooperation between workers and employers, and therefore lower total factor productivity levels (e.g., see López and Valdés, 2000).

57. Both farm and rural non-farm employment are particularly sensitive to labor regulations, particularly when these impede the flexibility to tailor the contracts to accommodate for firm and labor characteristics. Current labor regulations appear to be restricting rural employment opportunities. Earlier studies have raised the concern that the Brazilian labor code as it applies to agriculture was contributing to reducing salaried work and thereby encouraging excessive substitution from labor- to capital-intensive farming. Carneiro (Chapter 3, Volume II) finds that this concern continues to apply today. In the NE, the share of salaried workers in agriculture fell from 41% in 1981 to 32% in 1997, while during the same period there was a significant increase in "unpaid" (family) workers from 22% to 30%. Throughout the 1980s and 1990s, only 28% of the agricultural labor force was engaged in formal employment and earning a regular wage. This small proportion combined with the high share of aggregate output from medium and large commercial farms is illustrative of substantively lower labor productivity in the "unpaid" family farming sector. The evidence presented by Carneiro (Chapter 3, Volume II) is consistent with a strong anti-employment bias, showing: (a) the complexity and rigidity introduced by the labor code and the pro-labor bias in its enforcement, and (b) the high labor tax that is raising the total cost of hiring formal work to 102% of the basic salary. However, "hard" evidence on the magnitude in question would require a quantitative approach that captures the interactions among the various determinants of employment and this is currently not available for Brazil.

58. Two types of arrangements, cooperatives and "condominios", offer advantages for hiring temporary workers, but do not address the issue of hiring under longer term contracts. The rapid proliferation of indirect hiring through cooperatives and "condominios" for hiring temporary workers in agriculture was largely a market response induced by the rigidity in rural labor markets in Brazil. Cooperatives act as contractors and thus there is no formal link between workers and farmers as employers. While cash wages are about 30% higher than cash wages under traditional arrangements, workers forego several benefits such as severance payment, paid vacations, weekly rest, and the 13th salary. Condominios are employers associations and workers do have access to benefits extended in the formal sector, although cash wages are lower than under cooperatives. The number of claims against cooperatives has increased substantially, creating an atmosphere of conflict and tension in agricultural labor markets.

59. The fact that income per person among farm workers in the NE is generally extremely low underscores the importance of removing institutional and policy constraints that inhibit the growth of higher paid formal rural employment. The Brazilian government has already submitted
to Congress a package of reforms of the labor code, aimed at increasing flexibility and reducing the incentives to switch to informal arrangements. According to the analysis by Carneiro (see Chapter 3, Volume II), the most critical changes for improvement in the working of labor markets for temporary workers—meaning those that would favor more employment and higher labor income for the poor in rural areas, are:

- Reductions in the value and number of taxes that employers have to pay as social contributions when hiring temporary labor.
- Reductions in FGTS deposits and exemption of the 40% fine upon termination of contract, in the case of temporary employment.
- Encourage the organization of employer’s condominiums, extending all labor rights to temporary workers and avoiding future labor claims.
- Reduce pro-labor bias in conflict resolution by ending the legal power of the Labor Courts while retaining their standing to engage in voluntary arbitration in collective economic conflicts, at the request of the parties.

RNF Issues

60. Non-farm employment in rural areas is growing in Brazil. This mirrors recent trends throughout Latin America where RNF currently represents over one-third of total rural employment and generates 40% of rural incomes (Berdegue et al., 2000). There is consensus that RNF employment is desirable because it represents a critical component of a rural poverty alleviation strategy. Then the question is what is required and who pays to make rural areas more attractive for the creation of RNF employment. Moreover, RNF represent a variety of very diverse employment activities (including down- and up-stream farm activities as well as the industry and service sectors) rather than constituting an economic sector per se, and thus part of the challenge is to identify which activities are likely to be most dynamic in employment generation and their spatial distribution.

61. Overall, the study suggests that location matters in the context of developing RNF employment opportunities. This is a consequence of the spatially heterogeneous nature of rural poverty and its constraints (e.g., differences with respect to access to assets, household characteristics, institutional gaps, regional specificity, etc.) exit paths out of rural poverty are equally diverse. This would suggest that rural development programs and rural poverty alleviation strategies should be demand driven and tailored to meet these heterogeneous local needs. In this context, in addition to abstracting from community level heterogeneity, the failure of numerous rural development projects since the 1970s can be partially linked to inadequate community participation and local capacity, as well as the excessive centralization of decision making—a common source of politically induced resource misallocation (e.g., van Zyl et al., 2000). This warrants going beyond merely considering the heterogeneity of the poor and to actually encourage the poor to actively share in the identification of their needs and organize themselves so they can press effectively for their fulfillment (Lipton
and van der Gaag, 1993). In other words, a key objective in a poverty reduction strategy should be to encourage poor people within communities to build up the social ‘grassroots’ capital that simultaneously gives them a collective political voice and provides them the basis for involvement in the management of their own local development efforts.

63. Recent experience from an increasing number of developing countries suggests that properly decentralized development programs that are accompanied by parallel efforts to promote greater involvement and autonomy in decision making for local communities can offer genuine opportunities to improve rural development outcomes. These redesigned community based programs can be particularly effective with respect to the provision of a wide variety of public good infrastructure. For instance, a recent comprehensive evaluation (van Zyl et al., 2000) of the so-called Rural Poverty Alleviation Projects (RPAPs) introduced with cooperation by the World Bank in eight states in the northeast of Brazil, concluded that these have achieved the objectives and, to a large extent, the targets established at the start of the projects in 1995.

64. Among the public goods infrastructure sub-projects, rural electrification and water supply dominated the profile of community demands but the wide range of other infrastructure demanded (e.g., road improvements, small bridges, and public telephones) are reflective of the anticipated heterogeneity in development priorities across different communities. Many of the productive sub-projects (meaning those requiring direct investment into production or processing of agricultural and non-agricultural goods) that are typically demanded after communities infrastructure needs are met, were found to be successful depending on the complexity of the productive process (simple projects included “casas de farinha’s”, small irrigation schemes, and agricultural mechanization) and the extend to which the activity was exposed to market risks. More complex undertakings (e.g., clothing, ceramic and community brick factories) had some success but required a significantly greater provision of technical support.

**PRICE AND TRADE POLICY**

65. The analysis by López and Romano (Chapter 6, Volume II) revealed that larger farms tend to produce more tradable crops while smaller farms produce more non-tradable crops and, on the consumption side, small farmers spend a relatively higher share of income on food. These differences in the structure of production and consumption implies that:

- Trade liberalization that raises the relative price of exportables improves the revenues of non-poor farmers to a larger extent in comparison to poor (smaller) farmers;
- The marginal effect of a reduction in import tariffs on farm revenue is small and negative across farm sizes; and
- Devaluation is not likely to play an important role in increasing the incomes of the poorest farmers.

The output mix concentration on non-tradables of small farmers is also somewhat disquieting considering that factor returns are quite dependent on output prices. A significant expansion in their output could reduce their output price. By contrast, tradables in Brazil are practically “price-takers” and thus an output expansion would have no significant effect on their prices. For

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16 Past approaches such as the so-called Integrated Rural Development Projects (IRDPs) while premised on the need for more localized operations, failed both to properly involve local poor people in a participatory process and to build local social capital (van Zyl et al., 2000).
example, a rise of 10% in export prices (e.g. a result of a devaluation) increases the marginal returns to labor by 10%.

66. Avoiding real exchange rate appreciations and sharp interest rate fluctuations emerge as critical macroeconomic policy elements that will contribute to strengthen the competitiveness of the agricultural tradable sector (outputs and inputs); both on-farm and in downstream off-farm sectors. The latter would be very complementary with a trade policy regime that moves towards relatively low tariffs on importables (inputs and final products) because this should significantly enhance the export orientation of the sector. Together these macroeconomic policies can also have an important positive impact in the agricultural labor market. Under a reformed more flexible regulatory framework in rural labor markets, an exchange rate devaluation and trade liberalization are likely to have an important positive impact in the agricultural labor market by inducing higher real wages. This will help to revitalize the commercial agricultural sector and thus benefit landless agricultural workers and small farmers engaged in off-farm employment to complement their income.

TRANSFER PROGRAMS

67. Since 1991, there has been a substantial increase in the coverage of social security for rural workers in Brazil. Social security benefits paid to rural households as income support for workers in old age, for the surviving spouses and children of deceased workers, for the temporarily injured and the permanent disabled, have steadily increased. In addition to contributory pensions, the Previdência Rural currently pays a non-contributory social assistance pension for old age and disability to poor workers without a documented work/contribution history. Rural workers are allowed to receive an old age pension five years earlier than workers in urban areas. Under the Previdência Rural, all beneficiaries who qualify receive the equivalent on one minimum salary, regardless of their previous salary. A critical feature of the new program is the de facto combination of social insurance and social assistance for the elderly under a single regime. The former program is exclusive—requiring that beneficiaries contribute to qualify for benefits—while the latter is universally available to any worker who reaches the age of 70.

68. Recent evidence by Delgado (2000) report that the Previdência Rural: (i) constitutes an increasing share of household income among the rural poor, and (ii) has lead to a lower incidence of poverty in rural areas. However, the findings do not provide a clear answer as to whether the positive impact of rural pensions can be attributed to the successful implementation of contributory social insurance for rural workers, or to the expansion and increased generosity of non-contributory social assistance transfers.

69. The current actuarial and fiscal imbalance raises questions regarding the sustainability of the current program. This raises the question as to whether the current scheme should be maintained, or restructured into two separate programs: one based on earmarked payroll taxes (social security) and the other (social assistance) financed with a more broadly based source of finance, namely from the general government budget. The current scheme is laying the burden of income redistribution to rural households on the shoulders of workers and employers in the private sector. The net impact on income distribution is ambiguous, because due to lack of the necessary information, the incidence of contributory and non-contributory social insurance cannot be analyzed separately.

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17 See Packard, Chapter 8, Volume II.
A PRELIMINARY POLICY PORTFOLIO SELECTION ANALYSIS

70. Does Brazil currently have the right arsenal of policies and programs to combat rural poverty? An effective rural poverty strategy requires complementary programs and instruments that capture the heterogeneity in asset positions and household characteristics among the rural poor and thereby paved multiple poverty exit paths. A preliminary portfolio of potential policy directions was identified in the previous section. Given the realities of government budget constraints, the next step consists of prioritizing and selecting an "optimal" policy portfolio. While a comprehensive assessment was beyond the scope of this report, the overriding objective was to provide a strategic framework and policy suggestions, this section provides a methodological that permits a quantitative comparison of various government programs in terms of three criteria, namely their coverage, targeting, and cost-effectiveness (see von Amsberg, Chapter 8, Volume II).

71. The approach ranks programs by their effectiveness to transfer resources to the poor. However, some programs may have additional objectives that need to be considered in a more comprehensive evaluation. The approach focuses on the benefits received by the proportion of the population that falls in the bottom national expenditure quintiles, and the analysis compares eleven programs, namely land reform (Cédula da Terra), the Rural Poverty Alleviation Projects (RPAP), drought relief, school lunch program, basic health, PRONAF loans, access to electricity, children in primary and in secondary school, access to piped water, and pension recipients. The analysis requires several rather strong assumptions to fill data gaps and make programs comparable, and thus the results should serve as a practical departure point for further in-depth analysis, rather than a mechanistic and premature policy conclusions. Some programs are universal (basic health, education, and school lunches) and thus their low targeting does not mean that they should be abandoned. With some programs, non-monetary benefits for the poor are difficult to measure.

72. Overall, rural social spending is very progressive compared to total social spending in Brazil. Simply because the poverty rate is so much higher in rural areas, a less intensive targeting effort is necessary for bringing a larger share of the benefits to the poor. Rural social spending has a larger poverty reducing effect than social spending overall. This would suggest, on the margin, that increasing rural social spending more than urban social spending would have a greater effect on poverty reduction. The analysis conclude that approximately 30% of the total social expenditure in rural areas is captured by the poorest families (first quintile), which is relatively high compared to social programs overall. To some extent the extent of targeting reflects that some of the programs apply primarily to the Northeast, by far the poorest region in Brazil. Moreover, one would also expect that rural social spending would also be significantly more cost-effective in the NE, considering its higher incidence of poverty.

73. Several programs are well targeted but reach a small share of the poor (e.g., land reform) and, on the other extreme, some programs are poorly targeted and do not reach many of the poor (e.g., secondary education, urban services, and credit PRONAF). Regarding pensions, a caveat applies because income figures from pensions include both the Previdência Rural and the traditional social security program. Hence, the analysis underestimates the targeting effectiveness of the Previdência Rural program.

74. Finally, there are social programs that are both well targeted and reach a large share of the poor. The two programs that apply only to the Northeast—the Drought relief and the Rural Alleviation Projects (RPAPs) come close to this criterion. The analysis also suggests some tradeoffs between targeting and coverage, and between benefit size and coverage. With higher
coverage programs it is more difficult to control leakages, a challenge in up-scaling small and well-targeted programs. On the latter, more expensive programs but which provide significantly higher income streams such as land reform, reach only a small proportion of the poor, while cheaper programs such as RPAP can afford larger coverage.

Government Programs: Total Expenditure, Number of Beneficiaries, Coverage and Targeting Ratios.

<table>
<thead>
<tr>
<th>Program/Area</th>
<th>Total spending 1998 in R$ bn</th>
<th>Beneficiary Households (million)</th>
<th>Coverage Ratio</th>
<th>Targeting Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRONAF</td>
<td>1.65</td>
<td>0.72</td>
<td>6%</td>
<td>25%</td>
</tr>
<tr>
<td>Rural Electrification</td>
<td>0.04</td>
<td>5.10</td>
<td>40%</td>
<td>18%</td>
</tr>
<tr>
<td>Land Reform</td>
<td>1.90</td>
<td>0.37</td>
<td>11%</td>
<td>85%</td>
</tr>
<tr>
<td>NE Drought Workfare</td>
<td>0.56</td>
<td>1.20</td>
<td>56%</td>
<td>75%</td>
</tr>
<tr>
<td>Food Distribution</td>
<td>0.22</td>
<td>3.00</td>
<td>66%</td>
<td>41%</td>
</tr>
<tr>
<td>Piped Water Supply</td>
<td>0.41</td>
<td>3.40</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>Health Services</td>
<td>1.98</td>
<td>6.60</td>
<td>75%</td>
<td>31%</td>
</tr>
<tr>
<td>Ensino Fundamental</td>
<td>2.08</td>
<td>6.60</td>
<td>60%</td>
<td>45%</td>
</tr>
<tr>
<td>Ensino Médio</td>
<td>0.09</td>
<td>0.62</td>
<td>3%</td>
<td>17%</td>
</tr>
<tr>
<td>Rural Pensions</td>
<td>10.80</td>
<td>6.30</td>
<td>28%</td>
<td>13%</td>
</tr>
<tr>
<td>RPAPs</td>
<td>0.21</td>
<td>1.30</td>
<td>57%</td>
<td>70%</td>
</tr>
<tr>
<td>Total of Listed Programs</td>
<td><strong>19.92</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: von Amsberg, Chapter 9, Volume II.

75. Given the realities of government budgetary constraints, coverage and targeting criteria should be complemented by a rigorous cost-effectiveness of the various programs. In other words, how many Reais from the budget does it take to transfer one Real of benefits to the poor through the various programs as currently structured? A preliminary analysis is presented in the report, but—given the severe data constraints faced at this stage—should be interpreted as highly tentative. From a broader government (federal and state) budgeting perspective, however, an equally challenging budgeting issue emerges: how to allocate rural spending between ‘general’ regional development programs (e.g., infrastructure, development of commercial activities, etc.) and those specifically targeted at the rural poor.
APPENDIX: BACKGROUND STUDY SUMMARIES

1. A RURAL POVERTY PROFILE FOR NE AND SE BRAZIL: UPDATED FACTS

1-1. The purpose of this first section is to present a rural poverty profile for the northeast and southeast regions of Brazil. This poverty profile is based on the work by Romano (Volume II, Chapter 1) and Lanjouw (Volume II, Chapter 6) and summarizes information on the sources of income, expenditures, economic activities and living conditions of the poor. Previously little was known about the spatial distribution of the rural poor beyond the regional level. This profile includes information that was spatially disaggregated to enables comparisons not only between the two regions, but also across different states and various rural-urban locations. Several new findings are reported in this rural poverty profile and these represent new building blocks for poverty analysis and policy design in rural Brazil.

The Data: Constraints and Solutions

1-2. Before proceeding towards the chapter’s objective, we remind the reader that the analysis of poverty in Brazil’s rural areas, in contrast to urban areas, continues to be greatly constrained by the lack of data. The current analysis draws on two household surveys fielded in 1996, (the Pesquisa Sobre Padrões de Vida, PPV, and the Pesquisa Nacional por Amostra de Domicílios, PNAD) and the focus is on the northeast and southeast of Brazil. Both data sets suffer from strengths and weaknesses.18 On the one hand, the PPV reports quite detailed consumption expenditure data and permits the construction of price indices to account for spatial price variation (the data suggest that this is substantial across a large country such as Brazil). However, the PPV sample size is not large enough to be representative at levels of spatial disaggregation much below the regional and large metropolitan area level. On the other hand, the much larger PNAD sample is representative at the state level. However, the PNAD does not report expenditure data and the income measures are quite unreliable (particularly in rural areas).19

1-3. In addition to drawing on the PPV and PNAD data individually, we also report preliminary results from Lanjouw (Volume II, Chapter 6) that are based on a recently developed small-to-large survey imputation technique—see Elbers, Lanjouw and Lanjouw (2000) and Hentschel, Lanjouw, Lanjouw and Poggi (2000). This new approach enabled Lanjouw (2000) to capitalize on the individual strengths of both data sets while eschewing their respective weaknesses. These econometric techniques essentially allow for a preliminary breakdown of poverty that exploits the large coverage of the PNAD survey and employs the PPV definition of well being based on consumption expenditures. Moreover, this allows for a tentative spatially disaggregated snapshot of rural by state and by urban/rural location.20 A poverty profile at this level of spatial disaggregation was previously unavailable for Brazil and has provided several of

18 For a detailed discussion on the relative merits of these data sets, see Ferreira, Lanjouw, and Neri (2000a).
19 For instance, the PNAD income measure for the self-employed is based on a single question that fails to distinguish between gross and net income from self-employment activities (such as farming in rural areas). Moreover, this question fails to recognize that agricultural incomes accrue on a seasonal or annual rather than monthly basis. Such omissions are likely to introduce substantial distortion into the reported real living standard measures, particularly in rural areas (e.g., see Ferreira, Lanjouw, and Neri, 2000a).
20 These results draw on joint work Francisco Ferreira and Johan A. Mistiaen.
the new findings reported in this chapter.\(^2\) Finally, we note that the absence of comparable inter-temporal data (unlike other countries in the region such as Chile and Nicaragua) precludes an analysis of how this profile has changed over time.

**Poverty Headcount Measures**

1-4. Our first observation is that, contrary to popular opinion, poverty in Brazil is not an overwhelmingly urban phenomenon. In fact, despite the considerably larger urban population, poverty is so widespread in rural areas that, in absolute numbers, approximately 43% of the population in poverty are actually rural. From a regional perspective, rural poverty is concentrated in the more populated northeast where the headcount index is between 47% and 51% (in the southeast this ranges from 22% to 26%). While the relative regional difference between the northeast and southeast was previously known (World Bank, 1995), the overall magnitude of rural poverty in Brazil appears to have been underestimated. By further disaggregating beyond this regional level, Lanjouw (Volume I, Chapter 6) uncovered several additional new findings.\(^2\)

1-5. Firstly, of the total estimated number of poor in the northeast and southeast, about 83.6% and 90.3% respectively reside in remote ‘rural exclusive’ areas. The latter are defined as areas that do not meet any of the criteria defining a rural agglomeration (i.e., very few or no permanent structures, little or no infrastructure, and low population densities). Secondly, headcount poverty measures are among the lowest in rural areas directly adjacent to, but not formally incorporated into the urban perimeter of municipalities. In fact, in the northeast, headcount poverty measures in these locations are lower compared to those in urban areas. The picture emerging from this breakdown is that simple regional or dichotomous rural-urban comparisons appear to conceal much of what is of interest. There simply is no such thing as a “typical” rural or urban area in a large country such as Brazil.

1-6. In the context of rural poverty analysis, these findings are significant in at least two respects. Firstly, the urban versus rural dichotomy is inevitably somewhat subjective (usually depending on some population-related cut-off) and secondly, it is quite likely that the economies of smaller towns are linked more closely to the rural economy than they are to the economies of larger urban areas. This hints at the potentially vital role of the rural non-farm sector for poverty alleviation.

1-7. Romano’s (Volume II, Chapter 1) classification of the rural population into three groups—farmers, agricultural workers, and non-agricultural workers—according to a criterion of principal income source provides another revealing dimension to the poverty profile. Farmers and workers in agriculture have the highest headcount poverty measures (58% and 57% in the northeast and 27% and 29% in the southeast). By contrast, non-agricultural workers are characterized by headcount poverty measures of about half these magnitudes (24% in the northeast and 15% in the southeast). Moreover, these comparative findings hold consistently for different poverty measurement adjustments (e.g., higher poverty line, adult equivalency, and

\[^2\] The approach here is still in its first stages of implementation, and standard errors have not yet been calculated for the predicted poverty rates reported herein. Work on this front is in progress. A more complete description of the small-to-large sample methodology, the data sets, our econometric procedures, and estimates of other poverty measures is currently in preparation. The estimates reported here should therefore be viewed as provisional and subject to revision.

\[^2\] The poverty line was set at R$65.07 in 1996 São Paulo Reais. See Lanjouw, Chapter 6, Volume II and Ferreira, Lanjouw and Neri (2000) for more details regarding these preliminary results.
family size economies of scale in consumption). This lends further support to the finding that, regardless of regional location, non-agricultural workers comprises the relatively better off group. Thus, summing up, the bulk of rural poor in both the NE and SE (83.6% in NE and 90.3% in SE) live in low density, remote rural areas, and those that receive their main income via farming or agricultural labor are consistently the poorest groups.

Rural Household Characteristics by Income

1-8. Table 1 provides a summary of the main characteristics of rural households for the northeast and southeast regions by selected per capita income quintiles.\textsuperscript{23} The average annual per capita income in 1996 for the NE and SE regions was R$2,123 and R$3,056, respectively. These are well below the 1996 national GNP per capita level of 4,945 reais.\textsuperscript{24} In order to compare the average income between the two regions, income values should be deflated. After adjusting according to the price indexes calculated in Ferreira, Lanjouw and Neri (1999), the average income per capita in the SE region is about 54% larger than in the NE.

1-9. Romano (2000) also finds that income inequality is high in both regions. The per capita income of the highest income level is about 29 and 31 times larger than the lowest quintile for the SE and NE, respectively. The gini coefficient for the two regions together is 0.64, while the gini coefficients for the northeast and southeast regions calculated separately are the same and equal to 0.63. These measures indicate that inequality in income distribution in both regions is high and very similar and they are also larger than the gini measures calculated for the whole country (about 0.595 in 1996).

1-10. Income from farming is more important as a source of household income in the northeast, where it reaches on average almost 50% of total income, while the sum of agricultural wages and income from the non-agricultural sector make a much more important proportion of income in the southeast. Nonetheless, in both regions, agricultural income (self and salaried income) is more important than non-agricultural income. It is noteworthy that the importance of income from wage salaries in the agricultural sector in the northeast region is below 10%, while it reaches 32% of total income in the southeast region. This indicates that rural northeastern families are much more dependent on their own farm production compared to the rural southeastern families who depend more on work for larger farmers and non-farm employment.

1-11. In both regions the share of total income from farming is highest in the top quintile, and lowest in the mid income families. Romano (2000) reports that this pattern is strongest in the southeast. The opposite pattern is observed with regard to agricultural wages in the southeast. There the importance of wages in agriculture is highest for families in the mid income levels. In northeast, the share of income from salaried work in agriculture decreases with income, indicating that poorer rural families in this region are more depend on agricultural wages. The share of income from non-agricultural work activities increases with income in both regions, indicating that better-off households are more dependent on earnings in the non-agricultural sector.

\textsuperscript{23} For details and a complete quintile breakdown see Romano (2000) in Volume II of this report.
\textsuperscript{24} Ferreira and Paes de Barros (1999)
Table 1. Distribution of Mean Rural Population Characteristics across Income Groups (NE and SE, 1996/97)

<table>
<thead>
<tr>
<th>Source of Income (% of total income)</th>
<th>Southeast</th>
<th>Northeast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Poorest 20%</td>
</tr>
<tr>
<td>Per capita income ¹</td>
<td>3,056</td>
<td>339</td>
</tr>
<tr>
<td>Per capita income adjusted ²</td>
<td>3,801</td>
<td>455</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources of Income (% of total income)</th>
<th>Southeast</th>
<th>Northeast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Poorest 20%</td>
</tr>
<tr>
<td>Farming</td>
<td>23.8</td>
<td>32.8</td>
</tr>
<tr>
<td>Agricultural wages</td>
<td>31.6</td>
<td>22.2</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>28.9</td>
<td>27.0</td>
</tr>
<tr>
<td>Pension public</td>
<td>15.0</td>
<td>16.9</td>
</tr>
<tr>
<td>Other Non-labor income ²</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>% of households where at least one person receives pension</td>
<td>24.4</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Demographic Characteristics

| Number of people in household        | 3.8       | 4.6        | 3.4     | 4.5       | 5.0         | 4.3     |
| Age of head of household             | 45.9      | 44.4       | 45.5    | 47.2      | 42.6        | 45.6    |
| Dependency ratio (No. of family members divided by No. of workers) | 1.3 | 1.8 | 1.1 | 1.3 | 1.6 | 1.2 |
| Percentage of heads of household black or mulato | 42.5 | 62.1 | 21.9 | 69.1 | 67.8 | 74.7 |

Education

| Percentage of heads of households illiterate | 33.3 | 39.7 | 14.7 | 62.4 | 75.3 | 43.8 |
| Years of education of head of household     | 2.7   | 2.2   | 4.1   | 1.8   | 1.1   | 3.8   |
| Years of education of household members aged between 13 and 17 | 4.7 | 4.6 | 5.7 | 3.2 | 2.5 | 4.1 |

Access to Services

| Percent of households with access to electricity | 82.4 | 63.2 | 94.5 | 54.2 | 42.5 | 56.9 |

Gender

| Percent of households headed by a woman | 12.1 | 12.7 | 9.0  | 15.7 | 15.5 | 13.7 |

Source: Romano (2000) see Volume I of this report.

Notes: (1) Based on 1082 rural households; (2) all money values relate to annual income expressed in reais 1996, income includes imputed rental of property; and income quintiles were defined according to the per capita distribution within each region; (3) Relative to income including imputed value of home rental; (4) Per capita income consumption-adjusted for adult equivalency according to the Rothbath scale; (5) Relative to total household income not including imputed rental value; (6) Wages and self-employment; and (7) Excluding imputed rental.
1-12. Non-labor income is slightly more important in the northeast. Public pensions are by far the main source of non-labor incomes (contributing about 95% of the total non-labor income and note that private pensions are almost non-existent). The average proportion of total income from public pensions is 15% in the southeast and 18.1% in the northeast. Thus, public pensions constitute a key income source for the rural population. However, the middle income quintiles actually have the highest share of pension in total income (Romano, 2000) and the richest households receive the highest pension values in absolute terms. The proportion of households receiving pension follows the same pattern, with a higher percentage in the mid-quintiles.

1-13. In terms of demographic characteristics, as expected average family size is higher among the poorest and, in general, the average family size is greatest in the northeast. The dependency ratio defined as the number of family members per worker decreases with income. Moreover, income is positively correlated with the age of the household head of household. Overall, both these trends are very similar for the two regions. In the southeast there is also a more apparent distinction between income levels in terms of the race of the head of household, where people of white color head higher income households more frequently. In the northeast there is no large distinction between income levels.

1-14. Educational indicators are quite different in the two regions. In the northeast illiteracy is strikingly high, reaching 62% of all heads of household and 51% of all family members above 10 years of age. In the poorest fifth households, 75% of households are illiterate, compared to 44% in the richest quintile. In the southeast these figures are 40% and 15%, respectively. Education is strongly correlated with income, with almost all indicators improving as income rises in both regions. Comparing educational of the household head with that of their children, we observe that younger generations have had better access to education. However, there is a significant regional difference in the education measures (including of children), in that these are much worse in the northeast.

1-15. Access to services is quite limited in the northeast and a little better in the southeast. For instance, among the lowest income quintile group, only about 43% in the northeast and 63% in the southeast have access to electricity. Finally, we note that women head quite a high percentage of households (on average 12.1% in the southeast and 15.7% in the northeast).

Rural Household Characteristics by Employment

1-16. An examination of the rural population characteristics according to three employment criteria—farmers, agricultural workers and non-agricultural workers (Romano, 2000)—also provides several revealing insights into findings into the structure of the rural population, their main characteristics and differences in welfare status. From Table 2 we see that in both regions the group of non-farmers employed in the non-agricultural sector have better indicators than the other groups in terms of salaried wages, education and access to services.

1-17. In terms of per capita income the data actually shows that farmers receive higher income than households in non-agriculture activities do, albeit not by much. However, while it was possible to estimate income from farming in great detail, the same was not true for economic activities in the non-agricultural sector due to data constraints. Therefore, it is very likely that there is underreporting of income related to earnings from self-employment in the non-agricultural sector.
1-18. Agricultural workers present the lowest measures of welfare of all groups, and the differences are more accentuated in the northeast region where average per capita income is between three and four times smaller compared to the other groups. Southeastern agricultural workers earn about half the per capita income of the other households. However, Romano (2000) notes that in both regions, the top income groups of agricultural workers have higher welfare indicators than the poorest farmers and non-agricultural workers.

Table 2. Comparison of Mean Rural Population Groups (NE and SE, 1996/97)\(^1\)

<table>
<thead>
<tr>
<th>Income(^2)</th>
<th>Farmers</th>
<th>Agricultural Workers</th>
<th>Non-Agricultural Workers</th>
<th>Farmers</th>
<th>Agricultural Workers</th>
<th>Non-Agricultural Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita income(^3)</td>
<td>3,647</td>
<td>1,713</td>
<td>3,377</td>
<td>2,284</td>
<td>592</td>
<td>2,034</td>
</tr>
<tr>
<td>Per capita income adjusted(^4)</td>
<td>4,516</td>
<td>2,146</td>
<td>4,215</td>
<td>2,979</td>
<td>805</td>
<td>2,545</td>
</tr>
</tbody>
</table>

Sources of Income (% of total income\(^5\))

- Farming: 55.8% in Southeast, 0% in Northeast
- Agricultural wages: 13.6% in Southeast, 13.2% in Northeast
- Non-agriculture: 14.3% in Southeast, 22.1% in Northeast
- Pension public: 16.2% in Southeast, 4.2% in Northeast
- Other Non-labor income: 0.1% in Southeast, 0.9% in Northeast

Total: 100% in both regions

% of households where at least one person receives pension: 30.4% in Southeast, 11.3% in Northeast

Demographic Characteristics

- Number of people in household: 4.2 in Southeast, 3.8 in Northeast
- Age of head of household: 48.9 in Southeast, 41.0 in Northeast
- Dependency ratio (No. of family members divided by No. of workers): 1.4 in Southeast, 1.4 in Northeast

Education

- Percentage of heads of households illiterate: 33.9% in Southeast, 37.5% in Northeast
- Years of education of head of household: 2.7 in Southeast, 2.3 in Northeast
- Years of education of household members aged between 13 and 17: 4.7 in Southeast, 3.9 in Northeast

Access to Services

- Percent of households with access to electricity: 77.1% in Southeast, 82.9% in Northeast

Gender

- Percent of households headed by a woman: 10.0% in Southeast, 5.2% in Northeast

Source: Romano (2000) see Volume II of this report.

Notes: (1) Based on 1082 rural households; (2) all money values relate to annual income expressed in reais 1996 and income includes imputed rental of property; (3) Relative to income including imputed value of home rental; (4) Per capita income consumption-adjusted for adult equivalency according to the Rothbarth scale; (5) Relative to total household income not including imputed rental value; (6) Wages and self-employment; and (7) Excluding imputed rental.
Agricultural workers also receive a strikingly low proportion of income from public pension (4% in the southeast and 12% in the northeast) compared to non-agricultural workers for instance (32% in the southeast and 23% in the northeast). In absolute terms the differences are also large. Workers in agriculture receive about four times less compared to other groups in the southeast, and seven times less compared to northeastern non-agriculture workers. Overall, the importance of public pension is much higher in the northeastern rural areas, which are poorer than rural areas in the Southeast, but this analysis also indicate that within each region public pension benefits less the poorest rural groups.

In terms of demographic indicators, family size is highest for farmers and lowest for workers in the non-agriculture sector. Age of the head of household and average age of family are lowest and dependency ratio (number of family members to worker) is highest for households employed mainly in the agriculture sector. The indicators of educational level also point to workers in agriculture as the worse-off rural group. In the northeast the proportion of illiterate heads of household in this group reaches the exceptionally high rate of 81%. In the southeast the incidence of illiteracy is much smaller, but still high (reaching 28% of all adults in the group of agricultural workers) by Latin American standards.

By all measures of educational level, workers employed in the non-agriculture sector are significantly more educated than all other groups in both regions. However, farmers and non-agricultural workers of the lowest income terciles in the southeast have very similar indicators. Only in the highest income levels the difference widens. This may be indicating that in this region there is a quite distinct group of people of lower educational level among workers in the non-agricultural sector. Moreover, this supports the previous observation that the average income of this group is lower than the income earned by the poorest farmers and even agricultural workers in the southeast, while the average for all income levels in this group is larger than that of the two other groups. As a general rule, the education indicators for all groups in the northeast are worse than in the southeast. However, the interesting exception to note is that the richest non-agricultural workers in the northeast are better educated than their counterparts in the southeast, and by a wide margin.

In terms of access to services, farmers and agricultural workers do not differ much, but the gap between the two regions is enormous. In the northeast only 44% of all farmers have access to electricity compared to the 77% in the southeast. Finally, it is very striking that on average 30% of all non-agricultural households in the Northeast are headed by women and that the same figure for the Southeast is also relatively high at 20%. While these findings should be explored further, they appear to indicate that these families might have remained in the rural areas after the husband migrated or died, and that their income is significantly increased by pension payments. Indeed, this latter conclusion is supported by the fact that when only woman-headed households are included in the calculation, the proportion of total income from pension increases from 32% to 55% in this group. Moreover, the average age of families headed by women is quite high, at around 41 years. Pension in rural areas goes mainly to the elderly poor (World Bank, 1999) and the analysis here seems to indicate that it goes mainly to older rural women.

2. **DYNAMICS OF THE BRAZILIAN SMALL FARM SECTOR**

For this section we draw on Dias and de Barros (2000) and discuss the main structural transformations in the Brazilian agriculture during the past two decades. The principal focus is on the small farm sector and first objective is to identify the principal implications of these changes.
for the sector. The second objective is to formulate appropriate small farm sector policy suggestions in the context of these structural changes and implications. Following this brief introduction, the chapter is structured in two main sections that address these objectives in turn.

2-2. Small farms continue to be pervasive in Brazil. However, while in 1996 almost 50% of agricultural establishments were smaller than 10 hectares, these comprised only about 2.25% of the total area farmed in Brazil. By contrast, less than 11% of farms were larger than 100 hectares, but this group accounted for 80% of the total area farmed. Brazilian agriculture is characterized by a historical pattern of concentration, particularly in land ownership and consequently also in wealth. These facts are well known, but rural poverty and inequality in Brazil can no longer be explained solely according to land ownership patterns. Less recognized is that during the past two decades, simultaneous changes in prices and technology accompanied this pattern of wealth concentration. Examining these changes is a step towards formulating integrated rural poverty alleviation strategies.

2-3. This section illustrates how improvements in the terms of trade and technological changes jointly allowed for a continued expansion in aggregate agricultural supply despite: (a) a highly unstable macroeconomic environment; (b) a contraction of the industrial sector; and (c) substantial changes in agricultural policy that lead to greater market liberalization (resulting in falling input and output prices) and competitive pressures. However, the bulk of agricultural production was, and continues to be, generated by a small group of highly competitive farms. Moreover, these developments have been particularly damaging to poor small farmers that use relatively few purchased inputs (see Lopez and Romano, Chapter 5, Volume II).

Key Structural Changes and their Implications for the Brazilian Small Farm Sector

2-4. During the 1960s and 1970s, the central objectives of the government were to guarantee internal food supply stability, to stimulate the adoption of modern inputs and stabilize farm incomes. This resulted in a plethora of policy interventions which, unfortunately, turned out to adversely affect the agricultural sector in both the short and long run. The seminal research by Brandão and Carvalho (1990) showed that, under free market conditions, agricultural production would have been higher compared to what was actually produced under this myriad of price distortions. Furthermore, a number of these policy interventions—most notably subsidized rural credit and various rationing mechanisms—turned out to have a lasting effect on the structure Brazilian agriculture and rural poverty.

2-5. Subsidized rural credit compensated for the substantial drainage of resources from the agricultural sector induced by other market interventions especially export price distortions. According to Brandão and Carvalho (1990), on average the agricultural sector received net income transfers equivalent to 8% of agricultural GDP during the period from 1975 to 1983. The rural credit program and rationing programs jointly stimulated increases in the area cultivated and mechanization. However, these aggregate numbers mask the magnitude of concentration in rural credit redistribution. According to an earlier study by the World Bank (1989), in the 1970s only an estimated 20-25% of all farmers received subsidized credit and of these, less than 5% received more than 50% of the total allocated credit. Moreover, updated data in Romano (Volume II, Chapter 1, Table 3) suggests that, at least in the northeast and southeast, government subsidized

Moreover, in 1995 while only 1% of farms were greater than 1000 hectares, these accounted for over 44% of the total area farmed in Brazil (see Brandão et. al., Chapter 4, Volume II).
credit was biased towards larger farms. For instance, in 1996 only 1 to 3% of farms less than 10 hectares received government subsidized credit.

2-6. The macroeconomic imbalances that first began to plague the Brazilian economy in the early 1980s made it unfeasible to continue fueling the engine of agricultural sector growth in this fashion. The ensuing period of recessive adjustment and public spending cuts combined with a restrictive monetary policy heavily affected the agricultural sector. From the mid-1980s onwards, the volume of rural credit transfers to agriculture drastically declined and guaranteed prices were progressively lowered towards the prevailing market prices. Typically one anticipates that such dramatic changes would have curbed growth of the agricultural sector. However, despite the increasingly unfavorable macroeconomic environment, aggregate agricultural supply continued to expand. This raises two related questions: how was this continued growth possible and who were the gainers and losers?

2-7. The continuing good aggregate performance of the agricultural sector was possible primarily because of simultaneous improvements in productivity and terms of trade. Yield improvements, however, were not homogeneous among the main agricultural crops. The crops experiencing the highest productivity gains were by and large import substitutes such as corn, beans, and soy. Export crops such as coffee and cacao were not characterized by similar yield improvements. This suggests that Brazilian agriculture became more oriented towards meeting domestic demand. However, relevant chapters in two recent World Bank state economic memorandums, for Ceará (Valdes, 1998) and Pernambuco (Valdes and Mistiaen, 2000), report that the yields and production of certain horticultural export products such as table grapes have increased substantially during the last decade. Thus, the bottom line is that while yield improvements were heterogeneous among crops; they were largely homogeneous across farm types. Essentially the gainers have been the high technology, capital intensive farms. While these farmers have prospered, the profitability of low technology small-scale farming drastically eroded.

2-8. The bias against low technology small farm sector has originated because of a combination of developments:

- Firstly, high technology farmers purchased the modern inputs for which prices have been falling. These input prices have been falling relatively more rapidly compared to the output prices and consequently, because costs have fallen more than revenues, profitability has increased. Low technology, small and semi-subsistence farmers that did not use purchased modern inputs could not take advantage of these falling factor prices and only faced lower output prices. Consequently, these farmers experienced drastic erosion of profitability. 26

- Secondly, restructuring of the agri-food processing and marketing sectors (e.g., food processing industries, traders and supermarkets) lead to the development of a sophisticated production financing system and increased quality standards imposed by retailers. The reduction of government subsidized credit was compensated for by the private sector agri-processing and marketing industry. Capital-intensive farmers were able to substitute subsidized rural credit with self- and private-sector financing, and this allowed them to meet this demand for higher quality products.

26 One study (Alves, Lopes, and Contini, 1999) estimates that the monthly pay of family labor for farms under 10 hectares was estimated to have dropped to about R$ 37 in the North and to only about R$ 15 in the Northeast. This study also contends that for all regions, the income per employed family member on farms smaller than 50 hectares (note that 81% of total farms in Brazil fall in this size category) was less than one minimum salary.
Finally, technical assistance appears to have been directed towards import substitutes and larger farmers (see Table 3. Romano, Chapter 1, Volume II).

2-9. Thus, both the market and, to some extent, government policy appear to have reinforced the Brazilian agricultural sector's disposition towards technologically advanced producers and against low technology, small and semi-subsistence farmers. Moreover, federal agricultural policy essentially concealed the comparative advantages of the different regions in the country. As government intervention lessened and many public sector activities replaced by the private sector, investments, physical, and human capital began to shift into activities and regions with comparative advantages. This resulted in economic geographic effects both within and between regions.

2-10. From an inter-regional perspective, these effects were particularly pronounced between the southeast and center-west regions. The agricultural sector in the southeast contracted and both physical and human capital migrated into the center-western region where production became characterized by large scale and capital intensive processes. From an intra-regional perspective, market liberalization has triggered a reallocation of resources towards larger farms (i.e., transaction cost minimization) and producers located closer to the larger urban markets (i.e., transport cost minimization) and in more favorable agro-climatic regions.

2-11. Obviously these developments have affected the nature of rural poverty in Brazil. The bulk of the rural poor live in low density, remote areas and continue to depend on the agricultural sector as their main source of income—either via farming or labor. Unfortunately, it is precisely in these areas the agricultural sector is contracting. So, in light of the foregoing analysis, what are the main implications for government policy?

Policy Discussion for Rural Poverty Alleviation in the Small Farm Sector

2-12. Market conditions have been and will continue to be unfavorable for both workers and farmers involved in the low technology small farm sector. In other words, the invisible hand is unlikely to fill the pockets of these rural poor. Thus, there is a role for the government to help alleviate rural poverty. The question becomes to what extent the government can intervene to alleviate poverty in the small farm sector.

2-13. The small farm sector can be viewed as consisting of different farm types depending on the nature of binding capital constraints that prevent these farms to move into the profitable higher technology agricultural market. The capital constraints are either human (e.g., education, skills, and age of household head) or physical (e.g., credit). Some constraints, such as age of household head, will remain binding regardless of government interventions. Thus, some proportion of these farmers is unlikely to be able to make the necessary adjustments to move out of poverty. For this group of the rural poor, via government transfers one could implement a safety net that ensures a minimum income level. This could be achieved via a restructuring and expansion of the current pension scheme into a social security program. This option will be explored further in section 8 (see also Packard, Chapter 8, Volume II). A complementary policy alternative would be to relax human capital constraints via education and re-training efforts. This could allow people to move into the non-farm sector or provide skills needed for employment in the

27 For example, in the state economic memorandum for Pernambuco (World Bank, 2000), Valdes and Mistiaen describe a point in case: the economic geographic developments in the sugar cane sector.
high technology farm sector. Labor law reform in both temporary and permanent employment could also have significant impacts in terms of rural employment generation.

2-14. In terms of how to assist farmers with potential to survive in a competitive agricultural market, there are a number of possibilities worth considering. In the increasingly competitive agricultural market, small farms face two key obstacles: farm size and a wide geographical dispersion. Both of these give rise to transaction costs that essentially discourage private sector involvement. One possibility is the development of some form of cooperation/organization among farmers at the local level. For instance, the critical role played by cooperatives in the diffusion of technological innovations among small farmers is often underestimated. Stimulating the formation of organizations through which small farmers could operate jointly in input and output markets should be explored further. Such organizations of small farmers could ensure the individually near impossible tasks of maintaining high technology standards, guaranteeing product quality, receiving technical assistance, purchasing inputs, and the formulation of commercialization strategies that provide access to dynamic profitable markets. With regard to technical assistance, Lopes and Romano (Chapter 5, Volume II) report that improvements in this variable could significantly increase incomes of even the smallest farmers.

2-15. The small farm sector will also need credit to finance this transformation. Currently, because of the low volumes of capital required and the wide geographic dispersion of small farms, the private financial sector has typically not engaged in small farm production financing. Likewise, these same transaction cost have discouraged the private agri-food sector to provide production financing for the sector. Given this situation, it is critical that the government improves the geographic coverage of the current financial system. For instance, one alternative would be further stimulation of the PRONAF program. Another possibility is to stimulate the development of local credit agencies that organize and manage the credit portfolio of several farms to overcome transaction costs and seek financing via the private or public sector. There is already some evidence that such financial middlemen are emerging in the south of Brazil (e.g., Bittencourt, 1999). Moreover, Harberger (1995) notes that several recent programs have achieved significant success in targeting small farmers. These programs manage the issue of creditworthiness by extending credit to groups of small farmers (who jointly co-sign each loan and thus in effect internalize what would otherwise fall as a burden of default risk on the lender). Finally, stimulating local market integration and participation of the small farm sector representatives in the local political arena would provide them with an improved capacity to draw on public funds and services.

3. RURAL LABOR MARKETS

3-1. Labor market corrections are at the core of the agricultural adjustment process and constitute a key element in a rural poverty alleviation strategy for Brazil. While its influence on rural poverty reduction has often been overlooked in the policy debate, labor markets affect rural poverty both directly and indirectly. In a very direct sense, labor markets matter because poor rural households are much more dependent on wages than richer households. For example, in the rural southeast of Brazil, labor wages account for 54.6% of the income of poor households compared to only 21.6% for the non-poor. Labor markets also play critical indirect role because flexible and efficient labor adjustment increases the opportunities of the poor by facilitating reallocation across regions, skills and types of employment. Earlier studies have raised the

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28 In the rural northeast, labor wages account for 30.6% of the income of poor households compared to only 12.6% for the non-poor (see Lanjouw, Volume II, Chapter 6, Tables 10a/b).
concern that the Brazilian labor code as it applies to agriculture was contributing to reducing salaried work and thereby encouraging excessive substitution from labor intensive to capital intensive farming. The analysis by Carneiro (Chapter 3, Volume 11) confirms that this concern continues to apply today.

3-2. Labor contract legislation is critical because of it largely determines the degree of market flexibility. Agriculture is to some extent a special and difficult case. Agriculture activities are typically beset by considerable variability in both production and prices—and thus parallel fluctuations in labor demand—and are generally further constrained by the need to harvest and process production in a short period of time. Moreover, the sector is characterized by high monitoring costs and seasonal production patterns under typically very heterogeneous employment conditions, even within the same geographic region. Consequently, a labor code that establishes overly restrictive or too many regulations can result in two reinforcing effects: limiting the use of contracts that induce cooperation between workers and employers, and therefore lower total factor productivity levels (Lopez and Valdes, 2000). Both farm and rural non-farm employment are particularly sensitive to labor regulations, particularly when these impede the flexibility to tailor the contracts to accommodate for firm and labor characteristics.

Some Trends and Salient Features of Rural Labor Markets in Brazil

Trends in rural employment show several relevant features:

- The economically active population in the rural sector increased from 13.9 million in 1981 to 14.6 million in 1997. However, as expected, agriculture’s share declined slightly from 77% in 1981 to 69.2% in 1997. By comparison, the rural non-farm sector represented a small, albeit increasing share with 2.8% in 1997.29

- The number of salaried workers in agriculture declined during the 1980s and 1990s this trend was accompanied by an increase in informality (unregulated employment) in rural labor markets. In fact, between 1992 and 2000, formal employment in agriculture fell by 11%, compared to 0.6% in other activities.30

- At the national level, the share of salaried workers (28%), self-employed (33%), employers (3%), and ‘unpaid’ working family members (36%) in agriculture have remained quite stable through the 1980s and 1990s. However, there are significant regional differences in the trend of salaried versus self-employed workers in agriculture. One observes a decline in salaried workers in the poorest regions, especially in the northeast where informal employment has been rising. By contrast, salaried workers in Sao Paulo and in the center-west region have increased. This can be attributed to more and better employment opportunities in the center-west, southern and southeastern regions.

- Specifically for the northeast, while there was an increase in the size of the agricultural labor force, the share of salaried workers in agriculture fell from 41% in 1981 to 32% in 1997. By contrast, during the same period there was a significant increase in ‘unpaid’ (family) workers from 22% to 30%. By contrast, for example in the state of Sao Paulo, the share of salaried workers in both agricultural and rural non-agriculture increased.

- Since about 1977, real wages for both skilled and unskilled agricultural workers declined by 30%, with a relatively more pronounced reduction for temporary workers. However, while real wages recovered at times of low inflation and more rapid overall economic

29 Based on PNAD survey, from Projecto Rurbano, NEA-IE/Unicamp.
30 In 1997, 2.7 million salaried workers were employed in the Brazilian agriculture sector.
growth such as during the mid-1980s, the growth of informal employment in agriculture could be partly associated with the declining real wages in this sector, particularly in the northeast.

- For some families, this adverse outcome was partially offset by the extension of social security benefits to rural workers since 1991, irrespective of whether or not they had been hired as workers under a formal contract (e.g., alternatively self-employed, casual workers without a contract, or unpaid family workers). (see Packard, Chapter 8, Volume II).

The Labor Code for Farm Workers

3-3. In Brazil, contractual conditions for regular full-time farm workers (contracts registered via a labor card) are, in principle, the same as those applying for urban workers. These are: a 44 hours/week, normal workday of 8 hours, a minimum wage, severance payments, and benefits including maternity leave, annual and Christmas bonus. However, only a minority of the hired labor force in agriculture actually enjoys these benefits, because the share of permanent workers is quite small and because casual workers and sharecroppers normally work without a formal contract and thus do not have access to such benefits.

Table 3. The Current Composition of the Cost of Labor in the Formal Sector

<table>
<thead>
<tr>
<th>Taxes and Wage Deductions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Social Contributions</td>
</tr>
<tr>
<td>Social Security</td>
</tr>
<tr>
<td>Severance Payment (FGTS)</td>
</tr>
<tr>
<td>Education Salary</td>
</tr>
<tr>
<td>Accident Insurance (Average)</td>
</tr>
<tr>
<td>Sesi</td>
</tr>
<tr>
<td>Senai</td>
</tr>
<tr>
<td>Sebrae</td>
</tr>
<tr>
<td>Incra</td>
</tr>
<tr>
<td><strong>Sub-Total A</strong></td>
</tr>
<tr>
<td>B - Time Not Worked - 1</td>
</tr>
<tr>
<td>Weekly Rest*</td>
</tr>
<tr>
<td>Vacations*</td>
</tr>
<tr>
<td>Vacation Bonus</td>
</tr>
<tr>
<td>Short Notice</td>
</tr>
<tr>
<td>Injury Benefit</td>
</tr>
<tr>
<td><strong>Sub-Total B</strong></td>
</tr>
<tr>
<td>C - Time Not Worked - 2</td>
</tr>
<tr>
<td>13th Salary</td>
</tr>
<tr>
<td>Dismissal Costs</td>
</tr>
<tr>
<td><strong>Sub-Total C</strong></td>
</tr>
<tr>
<td>D - Cumulative Effects</td>
</tr>
<tr>
<td>Groups A and B</td>
</tr>
<tr>
<td>FGTS over 13th Salary</td>
</tr>
<tr>
<td><strong>Sub-Total D</strong></td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Brazilian Constitution and CLT.

* The total cost is reduced to 73.7% if weekly rest and vacations are deducted; these are practically universal benefits applying to all sectors.
3-4. Previous studies concluded that labor laws and the way in which the courts enforce this legislation in Brazil had increased the cost of hiring and firing rural workers, and thereby encouraging an “excessively” fast substitution from labor intensive towards capital intensive farming (Anderson, 1990, Mueller and Martine 1997, and World Bank, 1994). The 1994 World Bank report concluded that the 1991 legislative changes induced labor tax evasion, increased labor market informality and self-employment, and resulted in an estimated 17% reduction in formal agricultural employment.

3-5. Likewise, a recent analysis on Brazil’s agricultural labor market by Cameiro (Chapter 3, Volume II) concludes that the labor code and the way it is enforced by labor courts has been a constant source of market rigidity and highly conducive to informality. He concludes that, in monetary terms, the total cost of hiring a formal employee in Brazil is at least about 100% of the basic salary (alternative estimates suggest up to 160%), considered too high for an activity subject to considerable production and price risks. Moreover, there are so many taxes and contributions to be met that farmers usually find it necessary to hire an accountant and/or a lawyer to comply with the legalities for hiring temporary workers. Furthermore, upon dismissal without ‘just cause’, the employer must make an additional contribution equivalent to 40% of the balance of the accumulated deposits in the worker’s Fundo de Garantia por Tempo Servico (FGTS) account, provisions which might actually induce some workers to strategically incite their ‘unjustified’ dismissal. Thus the system is conducive to informality, and susceptible to the risk of dealing with expensive labor claims in labor courts.

3-6. For temporary work in agriculture, the rapid proliferation of both labor cooperatives and “condominios’ represent, in part, a market response to the risk of labor claims and the high payroll taxes. Under the former, cooperatives act as contractors that offer temporary labor, mediating the hiring of labor between employers (farmers) and workers. Their development was encouraged by a change in the labor code in Dec. 1994 which established that there are no formal labor links between farmers as employers and the cooperative workers. They are used primarily for the harvest period in products with a relatively long harvest period, such as coffee, sugarcane, and oranges. For employers, in addition to net savings on labor costs (savings ranging from 15 to 40%), the key advantage under cooperative hiring of labor is that farmers are less likely to be challenged by farm workers through judicial claims in labor courts, because it is the cooperative that is liable. In practice, cooperative workers receive wages that on average are approximately 30% higher than cash wages under traditional arrangements, but they forego benefits such as paid vacations, the 13th salary, weekly rest, and severance payments.

3-7. “Condomínios” are employers associations—encouraged by the government—hiring labor for temporary work for different farms, under which the condominium assumes the legal obligations in terms of workers rights. Thus it protect the workers from the more precarious conditions under the cooperative arrangement regarding their access to benefits. Workers under “condomínio” contractual arrangements have access to all the benefits extended to workers in the formal sector; however, important from the perspective of the employer, the cost of such provisions is shared by employers as a pro-rata to the numbers of days employed by each farm, thereby reducing their total labor costs.

3-8. Thus, although these two type of labor arrangements do not offer clear advantages for hiring under longer term contracts—which one would presume is a considerable distortion of Brazilian agriculture—for temporary work such type of contractual arrangement does introduce more flexibility and should have encourage more temporary employment. However, there are a number of questions currently being raised about the pro’s and con’s of these two options. It is significant that the number of claims against cooperatives has increased substantially, conducive
to an atmosphere of conflicts and tension in rural labor markets. On the other hand, because cash wages paid by condominiums are lower than those under cooperatives, albeit at the loss of their benefits, the attraction of a higher cash wage is encouraging most workers in favor of the cooperative arrangement.

3-9. The government has submitted to Congress a package of reforms of the labor code and this could become a critically important component of a strategy of rural poverty alleviation. As submitted, the new legislation would increase flexibility in labor markets and reduce the incentives to switch to informal employment arrangements in rural areas. According to the analysis by Carneiro (see Chapter 3, Volume II), the most critical changes for improvement in the working of labor markets for temporary workers—meaning those that would favor more employment and higher labor income for the poor in rural areas, are:

- Reductions in the value and number of taxes that employers have to pay as social contributions when hiring temporary labor.
- Reductions in FGTS deposits and exemption of the 40% fine upon termination of contract, in the case of temporary employment.
- Encourage the organization of employer's condominiums, extending all labor rights to temporary workers and avoiding future labor claims.
- Reduce pro-labor bias in conflict resolution by ending the legal power of the Labor Courts while retaining their standing to engage in voluntary arbitration in collective economic conflicts, at the request of the parties.

4. **Rural Land Markets**

"In economics, the relationship between poverty and land are unclear"

(T.W. Schultz, 1993, The Economics of Being Poor)

4-1. Land markets can be instrumental to reduce rural poverty. In principle, land will complement the household fixed assets, in that better access to land allows the low income farmer to make more productive use of family labor, provide some insurance to the poor against volatility in the labor market, and ultimately raise real income.

4-2. Important as land is and will continue to be for very poor rural households in some regions, in the aggregate we should be careful not to overrate land in the process of poverty alleviation. A fundamental proposition documented by much recent research on high and low income countries is the decline in the economic importance of farmland in its natural state and the rise in that of human and physical capital. This is reflected in the fact that the share of agricultural gross income that accrues to land rent have declined markedly over time, while that of human and physical capital has risen. One because agricultural research has provided substitutes for land. Also because it the modernization of agriculture which has over time transformed raw land into a more productive resource (Schultz, 1993).

4-3. For Brazil, Brandão, Bastos and Brandão (Volume II, Chapter 4) observe a dramatic reduction in the ratio of gross value of output to the farmland prices (rental values) has taking
place, falling from 300% (20%) in early 1990s to 83% (10%) in 1999. Thus, the income from land ownership is rapidly declining vis-à-vis purchased inputs, physical capital, labor, and entrepreneurship. Consistent with this decline observed during the 1990s is the fall in real farmland prices in Brazil. In their history on the evolution of land prices, Brandão et al. (Chapter 4, Volume I) distinguish several episodes since the early 1970s: an increase in real land prices up to 1975, fairly constant land prices during 1975-83, unstable and falling prices during 1984-94, and a significant decline since 1994. In their analysis of determinants of changes in land values, Brandão et al. and other authors perceive the influence of quasi-permanent factors, namely, cheaper land in Argentina and other Mercosur partners, relatively low inflation and higher real interest rates, efforts to increase land taxes, all factors that took away some of the attractiveness of holding to land as portfolio investment. As mentioned later in discussing land reform, it is hard to think of a more favorable land price environment for land redistribution programs which acquire land at its commercial value, such as under the program called Cédula da Terra.

**Evolution of the Farm Land Structure**

Brazil’s agrarian structure has remained largely unchanged during the last 25 years, in which large states coexist with a much larger number of small farms. During 1995/96 small farms (less than 10 ha) represented approximately 50% of the total number of farms (constant throughout 1970-95) and produce approximately 12% of gross farm output, while 10.7% of the farms (over 100 ha) produce 53% of gross farm output.

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<tbody>
<tr>
<td>0-10</td>
<td>17.8</td>
<td>14.8</td>
<td>13.0</td>
<td>11.8</td>
<td>12.2</td>
</tr>
<tr>
<td>10-100</td>
<td>40.0</td>
<td>38.5</td>
<td>37.7</td>
<td>36.4</td>
<td>34.4</td>
</tr>
<tr>
<td>100-1000</td>
<td>29.3</td>
<td>32.9</td>
<td>33.2</td>
<td>34.9</td>
<td>32.3</td>
</tr>
<tr>
<td>&gt;1000</td>
<td>12.6</td>
<td>13.6</td>
<td>16.0</td>
<td>16.8</td>
<td>21.0</td>
</tr>
</tbody>
</table>

Source: Brandão et al., Chapter 4, Volume II.

During the 10 year gap between the 1985 and 1996 agricultural census, the number of small farms declined by approximately 700,000 small farms (total farm land declined by 5.6% during the same period), and it is worth highlighting that tenant farmers (sharecroppers and cash tenancy) represents a low (and declining share of farm units, representing approximately 11% of all farm units. Management by owners is the predominant tenancy (74% of all farm units in 1995). The remaining 14% are squatters, which translates into a not insignificant figure of 710,000 units in 1995.

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<tbody>
<tr>
<td>Owners</td>
<td>66.76</td>
<td>64.06</td>
<td>65.72</td>
<td>64.60</td>
<td>74.16</td>
</tr>
<tr>
<td>Renters</td>
<td>13.76</td>
<td>11.41</td>
<td>11.36</td>
<td>9.91</td>
<td>5.51</td>
</tr>
<tr>
<td>Sharecroppers</td>
<td>1.98</td>
<td>5.98</td>
<td>6.18</td>
<td>7.65</td>
<td>5.70</td>
</tr>
<tr>
<td>Squatters</td>
<td>17.49</td>
<td>18.55</td>
<td>16.76</td>
<td>17.84</td>
<td>14.61</td>
</tr>
<tr>
<td># Farms (*000)</td>
<td>4.636</td>
<td>4.997</td>
<td>5.160</td>
<td>5.802</td>
<td>4.860</td>
</tr>
</tbody>
</table>

Source: Brandão et al., Chapter 4, Volume II.

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Land Rental Markets have been Atrophied by Land Legislation and Insecure Property Rights

4-5. Insecure property rights inhibit the development of land rentals and sharecropping. The very low proportion of tenancy farming in Brazil is understandable considering the provisions in the Land Statute under which tenants (even 'informal' sharecropping without a contract) can claim rights to the land, and to the risk of expropriation of such farms. This constraint for the expansion of farming under flexible tenancy arrangements including rentals is, in the authors' opinion, a potentially significant barrier for poor households access to farming at a relatively low social cost, an issue that deserves special attention. It is worth mentioning that in several countries in Western Europe, farm rentals is a predominant form of tenancy. Within the 25-50 has size range, rented farms represented approximately 75%, 50%, and 30% of farms in Belgium, Spain and Italy, respectively.

4-6. As agriculture becomes increasingly more capital intensive, and landlords are older, there are circumstances under which land rental markets (both fixed and share rent) maybe relatively more effective than land sales in (a) providing access to land for the younger and poorer entrepreneur, (b) facilitating the exit of farming without having to sell the assets (particularly for the elderly and the less competitive farmers), (c) accommodating short-term needs for land, and (iv) facilitating consolidation of the operational units by the more skilled entrepreneur at lower transactions costs in land rentals than in sales. In today's Brazil, it is not so much that the transactions cost of formal farm rental contracts would be excessively high but, it is argued, more influential is the risk of a de facto expropriation of farms rented out. Landowners are reticent to rent farm land beyond very short term contracts. The provisions of the Land Statute of 1964 provided nearly permanent rights to tenants after a few years, and contained other provisions that relate the incidence of renting and sharecropping to the expropriation of farms (World Bank, 1993). As argued by Brandão et al. (Volume 11, Chapter 4), the tenure insecurity resulting from the current legal framework is an important deterrent for the development of an active land rental market.

4-7. Without getting involved into a direct regulation of tenancy, which should be avoided, the government should take a proactive role in providing the right legal and institutional framework for the reactivation of the land rental market such as to make rented farms highly productive. As observed by de Janvry and Sadoulet (1999) based on the experience of other regions in the world, the land rental market has been one of the most effective ways of allowing access to land for the rural poor and the youth. Land rentals should be seen as an important complement to the redistributive land reform program currently being implemented in Brazil, which inevitably will leave unresolved the question of access to land for a large fraction of the potential beneficiaries because the entry subsidy needed for poor households to purchase enough land that will provide an income level above poverty is high. The focus of such a program on land rentals could take the form of consolidating property rights by a revision of the relevant land legislation so as to secure longer term contracts, assist in the development of a practical local approach for the resolution of disputes regarding interpretation and enforcement of the land rental arrangements (and sharecropping) so as to deal with compensation for investments attached to the land, providing access to credit and technical assistance to potential tenants.

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4-8. In addition, the impact of such a program would be enhanced by simultaneous adjustments of the labor code (see Carneiro, Chapter 3. Volume II) and in the land tax system. Labor laws have had an anti-sharecropping bias. Under informal or verbal sharecropping contracts (which are widespread), landlords will always face the risk of having the sharecroppers claim rights granted by the labor legislation, which are often recognized in the Labor Courts as evidence of 'occupation'.

4-9. Although not geared for small, low income farmers, the experience with the Rural Leasing Exchange in the Triângulo Mineiro, contains useful lesson. The Bank of Brazil, in conjunction with the municipal government and landowners developed what became the Bolsa de Parceria e Arrendamento Rural, based on 5 year contracts, renewable, in farms of 100 has or more. This program was not oriented to social goals, and the participants had more education and higher income than the typical rural landless worker. Overall, it has been considered quite successful, considering the farm income of tenants, vis-à-vis farms under the traditional ownership patterns, and it represents an approach which should be examined further because of its potential lessons for the land rental program proposed above.

Land Tenure Insecurity: Potentially Adverse Effects on Farm Productivity, Income, and Restructuring.

4-10. Research in other Latin American countries has shown that land tenure security was an important factor in increasing farm productivity. There is ample evidence also showing that land tenure security facilitates more farm restructuring. The availability of formal land titles and a well functioning registry is a close proxy for land tenure security, even though farmers with well recognized community norms on land transactions may possess considerable security even without legal land titles. Many areas of Brazil do not have a proper cadastre with accurate information on the quantity, value and ownership of real estate in agriculture, and systematic data on the number of land transactions do not exist. The tendency of Brazilian land markets to be thin means that reliable information is costly to obtain. The registries or ‘cartórios’ (kept by notaries in the states in which the land is located) often lead to multiple claims for the same parcel of land, and contain improper specification of the property boundaries. Entries to the “cartórios” must be distinguished from the “rural property cadastre” maintained by INCRA under the Land Statute, which is being used for expropriation purposes. This cadastre, based on self-assessment, does not provide an unambiguous characterization of farms, and it is legally restricted from disclosing information to prospective buyers of land.

4-11. This institutional failure does not prevent land market transactions, based on accepted titles of the property, but it does create an uncertainty about the property and thus raises the transaction costs of operating in this market. As shown for Honduras and Paraguay, land tenure security contributes to increasing total factor productivity via: (i) its effect on investment, particularly for investments in physical capital which is attached to the value of the land (such as orchards, land improvements, forestry, etc), and (ii) improving land market performance by facilitating the exit of uncompetitive producers and entry of more efficient producers. One would also expect that insecure titles would also constrain the development of rental markets,

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particularly in the current Land Statute which can give permanent rights to tenants after a few years in the property. One should add, though, that land titling does not guarantee that the poorest of the poor will gain access to land. A major point to be considered here is the cost of land registration of titles. According to the 1994 World Bank report on agriculture, it was considered too high for small (poor) prospective buyers and thus, kept a large number of them out of the land market.

4-12. It is surprising that a country with the level of development of Brazil and considering the economic importance of agriculture in its economy would be so far behind the modernization in such a critical factor market. The social rate of returns to a program to improve land administration and resolve disputes at low cost are likely to be high, and could have significant benefits for the rural poor directly through more access to land and indirectly through more employment. The cadastral system, the dispute resolution issues, and titling are the basic institutions that need improvement in Brazil.

4-13. To conclude, there is a need to open more opportunities through the land market for small-scale, labor intensive farming. This requires experimentation with new approaches. Brazil is well advanced in one such new approach in the form of its land reform program under Cédula da Terra. Much more could be done to complement such effort. A government program to reactivate the land rental market (including sharecropping) and to modernize Brazil's land administration are suggested as significant institutional developments which should have a high social payoff in enhancing both farm productivity and equity.

5. Farm Revenues and Factor Returns Determinants of Poor Farmers in Brazil

5-1. This section is based on the analysis by Lopez and Romano (Chapter 5, Volume II) of real farm revenues determinants using a sample drawn from the 1996 PPV data set. From a policy perspective, the objectives are threefold: (i) to estimate the effect of an exchange rate devaluation; (ii) to evaluate the impact of a trade policy reform (a uniform reduction of import protection), and (iii) to determine the effect of changes in factor endowments. Because nominal farm revenues are adjusted by a cost of living index, the effects of these changes can be quantified in terms of real farm revenues. Moreover, the approach explicitly distinguishes between poor and non-poor farmers.

Farm Characteristics

5-2. Important differences characterize the production and consumption structures of poor vis-à-vis non-poor farmers (Table 6). Firstly, poorer farms are predominantly small and vice versa. Secondly, total farm revenue shares of the three principal output categories—import substitutes, exportables, and non-tradables—differ among small (i.e., poor) and large (i.e., non-poor) farmers. In contrast to non-poor farmers, revenues of poor farmers are dependent more on non-tradables and less on exportables. In terms of input utilization, non-poor farmers own relatively more capital and livestock, and use more purchased inputs. A very striking finding is that only 2% of poor farms receive some form of technical assistance compared to 31% of non-poor farms. Moreover, the figures on subsidized credit follow a similar pattern with small farmer practically receiving none. Finally, on the expenditure side, poor farmers have greater consumption shares of food and smaller shares for manufacturing and non-agricultural services.
5-3. These differences in the structure of production and consumption are critical for at least two reasons. Firstly, because these determine to a large extent how price changes affect poor farmers differently than non-poor farmers. For instance, trade liberalization that raises the price of exportables would improve the revenues of non-poor (large) farmers to a larger extend relative to poor (small) farmers. Similarly, a real exchange rate devaluation that reduces the real price of non-tradables would have a negative effect that is relatively greater for poorer farmers. Secondly, the divergence in production structure can also result in different revenue elasticities with respect to various factor changes. For instance, while a marginal increase in farm size will result in higher revenues, its relative magnitude and significance is likely to differ among small and large farmers—likewise for other policy relevant variables such as technical assistance and education. Clearly, developing an appreciation for these differences is critical for the design of an effective rural poverty alleviation strategy.

<table>
<thead>
<tr>
<th>Table 6. Income, Production and Consumption Characteristics by Farm Size&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minifundia</strong></td>
</tr>
<tr>
<td>(&lt;sup&gt;up to 2ha&lt;/sup&gt;)</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
</tr>
<tr>
<td><strong>Sources of Income (% of total income)</strong></td>
</tr>
<tr>
<td>Farming (self employed)</td>
</tr>
<tr>
<td>Agricultural Wages</td>
</tr>
<tr>
<td>Non-Agricultural Labor</td>
</tr>
<tr>
<td><strong>Production Structure</strong></td>
</tr>
<tr>
<td>Total Household Land Size (ha)</td>
</tr>
<tr>
<td>% of Land that is Owned</td>
</tr>
<tr>
<td>Household Farm Revenue&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>% of Importables in Total Revenue</td>
</tr>
<tr>
<td>% of Exportables in Total Revenue</td>
</tr>
<tr>
<td>% of Non-Tradables in Total Revenue</td>
</tr>
<tr>
<td>% of Purchased Inputs in Total Revenue</td>
</tr>
<tr>
<td>% receiving technical assistance</td>
</tr>
<tr>
<td>% of farms using animal traction</td>
</tr>
<tr>
<td>% of farms owning machinery, equipment or vehicles</td>
</tr>
<tr>
<td>% of farms that received government subsidized credit</td>
</tr>
<tr>
<td><strong>Consumption Structure (% of total Expenditure)</strong></td>
</tr>
<tr>
<td>Traded Food</td>
</tr>
<tr>
<td>Non-traded food</td>
</tr>
<tr>
<td>Manufactured (non-agricultural traded) Goods</td>
</tr>
<tr>
<td>Others (e.g., services, housing, etc.)</td>
</tr>
</tbody>
</table>

Source: Lopez and Romano (Chapter 5, Volume II).
Notes: (1) Money values in reais 1996; all values relate to annual income and (2) Includes imputed values of self-consumption.

On the Effects of an Exchange Rate Devaluation

5-4. A nominal devaluation has a direct and an indirect effect on prices. On the one hand, the direct effect consists of the impact on the price of tradables that increase in proportion to the
devaluation. If real farm revenues are defined as revenue deflated by a CPI index, then the direct effect of a nominal exchange rate increase is to increase the output prices of tradables by the same proportion. On the other hand, the indirect effect is driven by the spillover on these price changes on the CPI index and the non-tradable sectors of the economy. Essentially, Lopez and Romano (2000) analyze the direct and indirect impacts within a framework that also enables a disentangling of the various price effects on farm revenues from those on the cost of living. In general, explicit consideration of the cost of living effects dampens the impacts of these price changes. The effect of a nominal devaluation on real farm revenues will be positive if the sum of production shares of traded agricultural goods is greater than the sum of consumption shares of traded consumption goods (including both agricultural and non-agricultural goods) in the consumption basket of farmers.

5-5. Lopez and Romano (Chapter 5, Volume II) computed different revenue functions and CPI indexes for each of the four different farm types. This allows smaller and larger farmers to be affected differently by price changes depending on their respective revenue elasticities and CPI index price weights. The authors find that a 40% nominal devaluation increases revenues of all farmers. However, the magnitude of impact differs substantially among them. The devaluation evaluated in real terms is proportional to the size of the spillover effect on non-tradeables (see Lopez and Romano, Chapter 5, Volume II). Assuming a 20% spillover effect (i.e., a 32% real devaluation), large farmers are estimated to receive the bulk of the benefits with real revenues increasing by 13.4%. Minifundia and small farmers benefit from an estimated real revenue increase of only 2.6% and 5.4% respectively. Simulations based on different price transmission coefficients lend further support to the finding that smaller farmers receive smaller benefits. This is because their revenues are highly dependent on non-tradeables and their consumption basket includes a relatively large share portion of traded goods. By contrast, large farmers tend to produce more tradables and their consumption baskets include a larger proportion of non-tradeable non-agricultural goods such as services, housing, education and transportation.

5-6. Thus summing up, devaluation is not likely to play an important role in increasing the incomes of the poorest farmers. But it does have an important effect on large farmers’ revenues. This could indirectly benefit the rural poor, especially the landless. Landless rural workers could benefit if large farmers substantially increase their labor demand as a consequence of devaluation. Some quantitative evidence pertaining to this effect is provided later in the analysis of farm revenue and factor return determinants. Finally, the fact that devaluation also affects prices of intermediate inputs in production could further reduce the benefits for farmers. However, for most small farmers the share of purchased inputs (e.g., fertilizers, pesticides, and seeds) in farm revenue is very small.

**On the Effects of Trade Liberalization: A Uniform Reduction in Import Protection**

5-7. Lopez and Romano (Chapter 5, Volume II) examine the effects of a uniform reduction in import protection that applies to all importables including both agricultural and non-agricultural goods. Reducing nominal protection implies a fall of the price of agricultural import substitutes and of non-agricultural importables. Also, since importable goods are important both in production and consumption, a fall of their prices means that demand for non-tradeables decreases

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34 Revenues are thus defined by a maximum value function that solves the farmer’s revenue maximization problem and these are deflated to real terms when divided by the CPI index (defined as a linearly homogeneous function of prices of agricultural and non-agricultural goods, both of tradables and non-tradables). Lopez and Romano (Chapter 5, Volume II) provide a detailed discussion of the underlying methodology.
as consumers substitute non-tradable goods (but the increased real income goes in the opposite direction) for the cheaper importables. At the same time, producers change the composition of their output reducing supply of importables and increasing supply of both exportables and non-tradables. Thus, reducing import protection causes: (i) a fall of the price of import substitutes goods, both agricultural and non-agricultural; and (ii) a likely decrease in the price of non-tradables, both agricultural and non-agricultural. Lopez and Romano (2000) find that a uniform reduction of 20% in nominal import protection causes very small real revenue losses for all farmers. Simulations indicate that these results are not very sensitive to different price transmission coefficients. Minifundia and small farmers suffer real revenue losses of about 3% whereas the effect on large farmers is negligible (ranging within a 1% band around zero).

On the Determinants of Farm Revenue

5-8. This analysis is based on the estimation of a farm revenue function using a normalized quadratic flexible functional form specification. The normalized quadratic was selected because it has the advantage of allowing the effects of explanatory variables to vary across the sample for different farm types (e.g., differences in land size, input use, capital, and technical assistance among others). Consequently, elasticity estimates are allowed to vary according to the characteristics of each of the four different farm groups. We now turn to a description of the principal findings.

5-9. Land Elasticities. The effect of per capita land on per capita farm revenues varies dramatically between large size farmers and the smallest farmers. The marginal effect of having more land is practically negligible for the latter while it is large and highly significant for large farmers with a revenue elasticity of about 12. This result goes against conventional wisdom that suggests an inverted U-shaped relationship where land productivity is low for small size farmers, high for medium farms and low again for large farm sizes. One plausible interpretation is that without certain other complementary assets and demographic characteristics the value of land by itself is very small. Remember that these are partial elasticities, as such they measure the marginal contribution of land to farm revenues given all other assets and demographic characteristics. For land to have a large impact it is necessary that farmers have less restrictions on liquidity to acquire purchased inputs, more education and more capital. More land by itself will have little impact, but without a minimum land area the returns to other factors of production and to desirable demographic characteristics also tend to be small. There thus is a synergy between land and other assets in the sense that these mutually reinforce productivity. This has often been neglected in previous analyses.

5-10. Liquid Capital (purchased inputs). The elasticity of purchased inputs is quite large for small farmers. The fact that these elasticities are much larger than the observed input shares (which are about 0.014) suggests that small size farmers are indeed liquidity constrained. That is, the marginal revenue of purchased inputs is much higher than their marginal cost. Comparing this with the land effect, it appears that facilitating the access of small farmers to credit to relieve their apparent liquidity constraints could be a much more effective way to increase their revenues than simply giving them more land.

The fact that the elasticity for medium and large farmers is not positive is counterintuitive at first. However, based on the IBGE Agricultural Census 1995/96, Dias and de Barros (Chapter 2, 35 Lopez and Romano (2000) provide a complete discussion of the methodological approach and estimation results in Volume II of this report.

36 Previous studies have shown that market failures, including lack of access to the credit market, affect the elasticity of small farmers responses of to various factors (e.g., de Janvry et al., 1991).
Volume II) reports that a significant group of farmers are characterized by average land sizes of about 40 hectares and above average use of intermediate inputs per hectare, while their revenue per hectare is the lowest of all farm groups. This suggests that a proportion of farms in this size category might be in a transition period where investments have not started to pay-off, otherwise these farms will not be feasible in the medium-run.

5-11. **Labor.** Not surprisingly, the marginal impact of (unskilled) labor on the farm revenue of small farmers is almost negligible. This is probably due to an excess supply of labor among the small farmers. What is more interesting is the fact that the labor revenue elasticity is so much greater among the large farmers. In fact, while the labor elasticity is lower than the estimated labor shares in the case of small farmers, it is higher for large farmers. This provides some quantitative evidence of the observation by Carneiro (Chapter 3. Volume II) that labor market imperfections are affecting the ability of large farmers to hire labor.

5-12. **Education.** The effect of education on farm revenues is practically negligible for small farmers. By contrast, the education elasticity is many times larger at about 0.97 for large farmers. The value of education is probably higher when farmers have larger, and possibly more complex operations. In this context, naturally education contributes little to increase farm revenues. Another factor that should be taken into consideration is the large difference in the level of farmers’ education, which is much higher in the larger farmers’ group. One more year of education at the elementary level is likely to have a smaller impact on revenues than one more year of education at a higher level.

5-13. **Technical Assistance.** The effect of technical assistance is quite similar for small and large farmer groups. Farmers with access to technical assistance have about 7% more revenues, ceteris paribus, than those that do not. So the potential for increasing farm revenues through increased technical assistance is quite significant and can be approximately equally beneficial to poor and non-poor. This finding is very significant in a policy context given that currently the distribution of technical assistance is skewed significantly towards the large non-poor farms (see Table 3). The group of farmers in the medium size category is even more positively affected, with an elasticity of 0.11.

5-14. **Use of animal traction.** Only large farmers obtain large returns to the use of equipment that use animal traction. The difference is also strong in the proportion of farms that use animal traction, 5% and 44% for minifundia and large farmers, respectively.

5-15. **Farm Operator Age.** Farm operators are relatively old and thus the effect of increasing age is negative for all farm groups. But the negative effects of aging on farm revenues are dramatically different across the groups. For farmers in the minifundia groups it is devastating, with an elasticity of -1.4, while for large farmers the negative effect is much more modest with an age elasticity of -0.13. That is, the loss of farm revenues of a 60-year-old compared to a 50-year-old farmer is about 28% among the smallest farmers compared to only 3% among large farmers. Large farmers presumably can compensate their physical decline by increasing hiring and/or by acquiring more machinery.

**The Role of Prices on Factor Returns**

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37 For instance, López and Valdés (2000) find that in Latin America, education does not significantly increase farm revenues with the exception of Chile, where the agricultural sector requires more skilled labor.
5-16. Table 7 summarizes how increases in prices and other variables affect factor returns. Higher relative export prices tend to reduce the value of technical assistance and increase the value of labor and purchased inputs. This suggests that exportable commodities are intensive in these factors. Also, it is possible that technical assistance is currently biased more towards producers of import substituting crops (e.g., see Dias, 2000) and that this explains the negative effect of export prices and positive effects of importable prices on the returns to technical assistance.

Table 7. Effects of Increases in Prices and other Variables on Factors Returns

<table>
<thead>
<tr>
<th>Returns to</th>
<th>Land</th>
<th>Technical Assistance</th>
<th>Education</th>
<th>Inputs</th>
<th>Labor</th>
<th>Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price of Exportables</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Price of Importables</td>
<td>-</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Price of Non-tradables</td>
<td>+</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Land</td>
<td>+</td>
<td>-</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Education</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>n.a.</td>
<td>n.a.</td>
<td>0</td>
</tr>
<tr>
<td>Technical Assistance</td>
<td>-</td>
<td>n.a.</td>
<td>n.a.</td>
<td>+</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Source: Lopez and Romano (Chapter 5, Volume II).
Note: (n.a.) not applicable.

5-17. The negative effect on land is small but the positive effect of the relative export prices is quite large and is by far the most important factor affecting labor returns. In fact, a 10% increase in the latter increases the marginal value of labor by about an equal percentage. This suggests that policies such as exchange rate devaluation and trade liberalization are likely to have an important positive impact in the agricultural labor market by inducing higher real wages. By contrast, import protection leading to higher domestic relative prices of importables tends to increase the value of inputs but does not seem to affect labor returns.

5-18. The effect of increased prices of importables on land rent is negative and quite strong. The price of importables exerts a negative effect on land rents. Technical assistance tends to reduce land rents but to increase the value of purchased inputs. This suggests that technical assistance promotes the demand for purchased inputs, which is not always satisfied especially in the case of small farmers. The returns to purchased inputs are positively affected by higher prices of exportables and importables but are reduced by higher prices of non-tradables. Thus, the demand for purchased inputs is likely to increase substantially following a devaluation of the real exchange rate. The shift in the structure of production towards exportables and importables and away from non-tradables is responsible for this to the extent that production of agricultural tradables is more intensive in purchased inputs than production of non-tradables. Thus, the substantial real devaluation that Brazil has experienced is likely to make lack of credit and liquidity much more costly than before. Or, equivalently, the benefits of increasing credit to farmers are probably going to be much larger now than before devaluation.

6. **RURAL NON-FARM EMPLOYMENT**

6-1. Experience in Latin America, and the developing world more broadly, indicates that the non-farm sector is often surprisingly large in size and often more dynamic than the agricultural
sector. However, the sector is generally found to encompass an enormous variety of activities, not all of which can be regarded as very productive and likely to offer great prospects for upward economic mobility. It is often observed that vulnerable segments of the population, such as women, minority groups, and the poor in general, tend to be concentrated precisely in those rural non-farm activities, which do not contribute much to household income. However, such an observation is not sufficient to warrant the conclusion that the non-farm sector is of only limited relevance to poverty reduction efforts. First of all, it is possible that appropriate policy intervention could influence the degree to which the poor are excluded from the more remunerative non-farm activities. Second, a growing non-farm economy can generate second-round effects (such as wage rates in agriculture) which may indirectly benefit the poor in a substantial way. Third, even the low returns that accrue to the poor in their relatively unproductive non-farm activities can play a critical role in preventing them from falling even further into poverty.

6-2. Over time, the non-farm sector in Brazil appears to have been growing. Between 1981 and 1995, non-farm sector employment grew at an annual rate of around 1.7% per year (Del Grossi, 1999). However, this aggregate number masks considerable variety across sub-sectors. For instance, employment in construction has been declining at a rate of around 4.3% per year, while domestic service and municipal administration has been growing at rates of 5.3% and 9.8% per year. Overall, employment growth in the non-farm sector has been more rapid during recent years than employment growth in agriculture. In this chapter (see Volume II, Chapter 6 by Lanjouw) we examine the characteristics of the non-farm sector in rural Brazil and we focus on the Northeast and Southeast regions of the country only.

Rural Non-Farm Characteristics

6-3. Non-farm activities are found to represent up to a third of primary occupations in rural areas of these regions. These activities tend to be more common in the rural Southeast of the country, but even in the Northeast, more than a fifth of the economically active rural population has as principal occupation a non-farm sector job. These figures understate the full size of the rural non-farm sector because many are likely to combine agricultural activities with non-farm activities, and as such, would record non-farm activities as secondary rather than primary occupations.

6-4. Scrutiny of the sub-sectoral breakdown of non-farm activities in rural Brazil reveals the importance of service sector activities, particularly own-account services (such as domestic service). Construction, food processing, commerce, education, and general administration activities are also numerically important. While a wide range of manufacturing activities can be discerned, they do not dominate the non-farm landscape.

6-5. Non-farm activities are disproportionately represented in those rural areas, which are better connected, to the broader economy. They are concentrated periurban areas or in rural towns, even though the bulk of the rural population, and in particular the rural poor, are found in more remote rural areas. Women are well represented in the non-farm sector but tend to be concentrated in two sub-sectors: self-employment and education.

6-6. Multivariate analysis, examining the correlation of non-farm employment in rural Brazil reveals the importance of education in determining the probability of employment in non-farm activities. In both the Northeast and Southeast, there is strong evidence that the educated, particularly those with secondary education or higher, have better prospects in the non-farm sector.
sector. This is emphasized when non-farm activities are divided into low-return and high-return activities. Education is a particularly important determinant of employment in high remunerative non-farm activities. Breaking the non-farm sector into two types of activities also reveals that men and women tend to concentrate in different non-farm sectors: the women in low-return activities and the men in high-return activities. The patterns are broadly similar for both the rural Northeast and Southeast, except that in the Southeast, there is also some suggestion that, controlling for individual and household characteristics, whites enjoy some advantage in obtaining high return non-farm jobs over non-whites.

6-7. Non-farm income shares tend to rise with overall consumption levels, although the relationship is rather flat. However, the composition of non-farm income changes markedly. The lower quintiles of the consumption distribution tend to earn a larger share of their non-farm incomes from wage labor activities. For the poorest population, low-return wage labor activities tend to be more important, while high-return activities are spread rather evenly over the consumption distribution. What is striking is that non-farm enterprise income rises very sharply with consumption quintiles: income shares from self-employment/enterprise activities are concentrated among the richer quintiles.

6-8. Non-farm income shares are distributed in an interesting way within landholding classes. The landless, unsurprisingly, receive a large share of their income from non-farm activities. These non-farm incomes also include self-employment/enterprise incomes, and as such this indicates that the landless are not uniformly poor. In the rural Northeast, the very largest landholding classes also receive a sizeable share of income from non-farm sources, while in the Southeast, large landowners tend to concentrated on agricultural activities.

6-9. Non-farm earnings are related, in a way similar to employment probabilities, to education levels, gender, and region. The better educated earn considerable returns on their education, with the premium being particularly high in the rural Northeast. Women tend to earn less, controlling for their education and other characteristics. In both regions, it seems that an individual, who was born in urban areas rather than in his/her current rural place of residence, enjoys higher earnings from non-farm activities than a rural born person. This may indicate that at least some of the rural occupations, particularly those associated with higher ranks, may be recruited out of urban areas rather than locally. Earnings tend to be highest in regions such as the state of Sao Paulo, where the rural sector is small and the urban economy is most vibrant.

6-10. What might be some of the emerging policy considerations that arise out of this analysis? The general patterns suggest that, among other things, governments may wish to pay particular attention to the construction and education sectors in rural areas. Employment levels in the construction sector have been declining in recent years. The sector is an important source of employment (particularly for men) and appears to offer good returns. It is typically well targeted to the poor as it does not generally demand high educational qualifications and the nature of the work is such that those with alternative options typically choose those alternatives. It also has a well-recognized function as a counter-cyclical means of employment generation, particularly in the drought prone Northeast of the country. It is not clear as to what extent the decline in employment levels in construction has been due to favorable weather conditions, which have reduced the need for employment generation. It is also not clear from the data at hand to what extent the decline in construction sector employment is due to a decline in public spending as opposed to reduced private investment in construction activities. The analysis here can, at best, highlight the significance of this sub-sector of the non-farm sector. Further analysis is required to spell out what, if any, options exist for policies directed at the construction sector.
6-11. The education sub-sector also deserves consideration. First of all, one of the more robust findings from the analysis is that education has an important influence on opportunities and earnings in the non-farm sector. The education sector also happens to be an important non-farm sector source of employment, particularly for women. Expansion of the provision of education would thus have the joint benefit of improving the prospects of the younger generations in the non-farm sector, while providing, at the same time, an important source of employment to a segment of the rural population which appears to be relatively poorly placed where earning significant non-farm incomes is concerned.

6-12. We find that the non-farm sector in Brazil appears to be closely linked to location. In particular, there seems to be clear evidence that the non-farm sector is more vibrant in those areas which are well connected to markets and which enjoy certain minimum standards of infrastructure. While this connection between the non-farm sector and infrastructure is not new, it continues to raise important policy challenges. A growing consensus is emerging to incorporate the participation of the private sector in the provision of infrastructure in many Latin American countries. What remains to be determined is to what extent these initiatives are able to secure the kind of rural infrastructure provision which is most necessary to promote the non-farm sector. Moreover, in a policy-wide context, it is also important to consider the interactions of these initiatives with other policies, most notably land reform. For instance, the synchronization of land reform policy with infrastructural developments is important because the latter will increase the price and value of land.

6-13. While the non-farm sector in rural Brazil appears to offer some opportunities to address rural poverty, the analysis in this paper does suggest that a sense of perspective be maintained. The rural poor tend to be concentrated in the most remote rural areas. They typically possess the lowest levels of human capital. The non-farm sector, on the other hand, particularly the high-return activities, which are most directly able to lift people out of poverty, tends to be concentrated in the more urbanized rural areas, and to employ persons with secondary and higher levels of education. It is unclear exactly how much one can expect from the non-farm sector, in terms of rural poverty reduction, in the short-run.

7. RURAL EDUCATION

Rural versus Urban Education

7-1. In analyzing Brazil as a whole, the difference between urban and rural schools is striking. This difference shows up in enrollment, repetition rates, test scores, and inputs.

7-2. Between 1991-98, net enrolment (7-14) rates increased from 91% to 96% in urban areas and from 75% to 91% in rural areas. While this is an indication of substantial progress, especially in rural areas, there is also still a lot of room for improvement. These 9-10% of rural school age children that are not enrolled correspond to 400,000 kids in the rural NE and 300,000 in the rural SE (see Soares et. al., Chapter 5, Volume II).

7-3. Rural education essentially continues to be a 1st to 4th grade affair. The first four grades accounted for 85% of enrolled rural children in 1998 (down from the 92% in 1991) as opposed to 50% for Brazil as a whole. In the same year, only 6% of 5th to 8th graders in Brazil were rural children and, representing a mere 1% of total enrollment, rural secondary education continues to be virtually non-existent.
While the increase in 1st to 4th grade rural enrollment rates in part reflects improved access to schooling it also represent decreased repetition rates. Regarding progress, the evidence suggests that repetition of grades remains a critical issue in Brazilian education, especially in rural areas where it is not uncommon for children to repeat the same grade several times. Similarly, SAEB standardized test score comparisons indicate a significant gap between urban and rural students.

The rural-urban differences in educational resources are equally striking. With regard to teaching staff, despite improvements during the 1990s we still find that in 1998, 18% of rural teachers are individuals with incomplete primary education (0% in urban areas) and only 5% have completed higher education (28% in urban areas). The same gap that exists in teacher qualification also exists in physical (e.g., bathrooms and sanitation) and pedagogical (e.g., library, computers and audiovisual equipment) school infrastructure. For example, while practically all urban schools have sanitation infrastructure, about 30% of rural schools have none. The under-equipment of rural schools is even more striking in terms of pedagogical facilities: only 3% have computers (44% in urban), 7% a library (58% in urban) and 27% audiovisual equipment (91% in urban).

Rural Heterogeneity: NE versus SE

Regional comparisons of rural education indicators reveal that there is not one rural education but many. While differences in terms of net enrollment have become small in recent years as most rural school systems approach universal coverage, 90% of children enrolled in the NE are studying in the 1st to 4th grades compared to only 68% in the South. This indicates both the fact that NE coverage is catching up but also that repetition rates are higher and kids spend more time in the first four grades. In other words, grade repetition is substantially more frequent in the North and Northeast and rural students from these regions also perform the worst in terms of standardized test scores. The same differences exist in human, physical and pedagogical inputs. Twenty-seven percent (27%) of teachers in the rural NE have not completed their primary education versus only 4% in the South and similar differences also emerge when comparing physical and pedagogical school infrastructure.

In the rural South, the education indicators are not only much better compared to the rural North and Northeast but, in addition, school results for rural Southern children are not that different from their urban counterparts. For instance, in the South there is practically no difference in the rate of grade repetition between rural and urban schools; likewise with regard to physical school infrastructure. This observed regional heterogeneity raises a number of important questions in the context of education and its role in the context of a rural poverty alleviation strategy.

Key Issues

Two principal issues emerge out of this descriptive data concerning education. First is the issue of how to get the current population of rural children to enroll in school (and remain enrolled in school) and how to improve their school performance. Second, we need to examine more carefully the various ways in which education improves living standards ex post. Equally important is to bring rural children up to urban standards as education is a basic right, independent of where a child happens to be born.

Note that it is therefore best to use "successfully completed years of education" as opposed to using "years of education".
7-9. The Brazilian Education Ministry’s current position has been to emphasize universal programs that increase school quantity and quality for all. According to this approach, if rural schools are given the same conditions as their urban counterparts, then they should be able to achieve the same results. While there is much to commend this position and the efforts of the Ministry in pursuing universal standards has been both impressive and effective (as in the case of the FUNDEF), the question remains whether rural education should not be looked at with special care. Evidently, there are many Federal programs specifically targeted to rural schools, but their ensemble still falls somewhat short of a comprehensive rural education strategy.

7-10. In terms of further study, it is clear that additional information is needed on the issue of whether rural education has a specificity that makes it qualitatively different from urban education. The comparative findings suggest that to effectively interpret the reported education indicators in terms of a poverty alleviation strategy we need to obtain a more disaggregated education profile. First, we need to find out more about the household characteristics of those children that are enrolled in school versus those that are not. Some examples of important household characteristics are: income, principal source of income, number of siblings, and educational level of parents—particularly of the mother. Second, we need to uncover the determinants of rural and urban school attendance and performance. For instance, we need to find out whether these 400,000 children in the rural NE that were not enrolled come mainly from those poor semi-subsistence farming households in the NE arid and semi-arid rural areas with access problems or whether these were simply children that tired of repeating and dropped out of school. If the former were the case, it is not at all clear whether provision of educational services to this rural group should not be approached from different perspective. To what extent is rural non-attendance explained by opportunity costs of child labor at the farm? To what extent is it derived from lack of schools? To what extent does it follow from simply poor schooling quality and multiple repetitions? If so, why do these differences exist and persist? Is there something called “rurality” that makes rural schools essentially different from their urban counterparts or are they simply worse because they have less educated teachers and poorer infrastructure. Clearer answers to these questions will facilitate finding the appropriate mix of demand-side programs such as Bolsa Escola, universal programs such as FUNDEF, and specific rural education programs to bring rural education up to at least urban levels.

8. A NOTE ON RURAL PENSIONS AND RURAL POVERTY

8-1. Since 1991, there has been a substantial increase in the coverage of social security for rural workers in Brazil. First the 1988 Federal Constitution established special eligibility conditions for rural workers in the private sector; however these new conditions were not effectively extended until 1991, when Congress passed the implementation regulation. Social security benefits paid to rural households as income support—for workers in old age, for the surviving spouses and children of deceased workers, for the temporarily injured and the permanently disabled—have steadily increased. The principal forms of benefits paid by the Regime Geral da Previdência Social (RGPS) to rural households in 1999 were Old Age (61%) and Survivor (25%) benefits. The principal rural recipients of these benefits are typically households headed by either elderly male agricultural workers or by widowed women (among whom the incidence of benefit collection is highest, e.g., see also Beltrão et al, 1999).

8-2. In addition to contributory pensions (length of service and old age), the RGPS pays a non-contributory social assistance benefit for old age and disability to poor workers without a documented work/contribution history—which Packard (Chapter 8, Volume II) refers to as
“social assistance pension.” Rural workers can receive the social assistance pension (identical in value to the old age pension) upon reaching 70 years of age, or if they become disabled. Moreover, rural workers are allowed to receive an old age pension five years earlier than their workers in urban areas. As argued by Packard, the special eligibility and benefit parameters of the old age pension program for rural workers correct several of the usual regressive structural biases associated with the pay-as-you go schemes. Because it is difficult to verify earnings and contributions histories for rural workers, and because many earn less than the minimum wage, rural recipients of Old Age pensions on average receive a “top up” from RGPS to their benefits. The data by Packard shows that most beneficiaries receive a pension equal to the minimum wage.

8-3. Following this expansion of coverage and the increase in the minimum RGPS benefits in rural areas, recent studies (Delgado et al. 1999, David et al. 1999) report that pensions: (a) constitute an increasing share of total household income, (b) have contributed to a lower incidence of rural poverty, and (c) have lead to measurable improvements in the welfare of recipient rural households. However, while the evidence indicates that the current pension program has helped the rural poor, there is no evidence as to whether this can be attributed to successful or simply to an expansion and increased generosity of the non-contributory social insurance for rural workers.

8-4. A critical feature of the RGPS is the facto combination of social insurance and social assistance systems for the elderly under the single regime. The only statutory difference between the two benefit programs is that the former is exclusive – requiring that beneficiaries contribute to qualify for benefits – while the latter is universally available to any worker who reaches the age of 70. This raises the question as to whether the current scheme should be maintained or, restructured into two separate programs, namely one based on earmarked payroll taxes (social insurance) and the other financed from the general government budget?

8-5. On the one hand, the current scheme is laying the burden of income redistribution to rural households solely on the shoulders of workers and employers in the urban private sector (specially as reforms shift the RGPS away from redistribution and towards actuarially fair public pensions) policy makers risk providing workers with additional motives to evade participation. Moreover, the current actuarial and fiscal imbalances further add strength to the restructuring argument by questioning the sustainability of current scheme. On the other hand, Packard is careful to add that from a political economy perspective, by locking the public pension receipts by rural households, contributive and non-contributive alike, firmly within a system benefiting a large constituency of poor and non-poor, policy makers might effectively insulate a critical poverty alleviation program from careless budget cuts.

8-6. It is possible that the current poverty impact and welfare benefits might be improved if the current contributory old age pensions program were restructured as social assistance with a more secure broadly based source of revenue. However, because the incidence of contributory and non-contributory social insurance can currently not be analyzed separately, additional data and research is needed to determine whether there would be significant efficiency gains associated with restructuring the current program.

9. **Public Policies to Reduce Poverty: A Selective Assessment**

9-1. This section draws on the paper by von Amsberg (Chapter 9, Volume II) to present an assessment of social spending in the rural regions of Brazil from a poverty alleviation perspective. The analysis generally focuses on the social spending received by the proportion of
the population that falls in the bottom national expenditure quintile. This focus is warranted because the respective proportions of the population that fall in the bottom quintile and below the poverty line correspond almost exactly. For instance, the preliminary expenditure based headcount poverty measures from Lanjouw (see Volume II, Chapter 7, Figure 1) estimate that in the rural Northeast and Southeast, 49% and 24.9% of the respective populations are poor. From von Amsberg (see Volume II, Chapter 9, Figure 1) we see that the proportions of the populations that fall in the bottom quintile of the national expenditure distribution in each corresponding region are 49% and 25% respectively.39

9-2. The assessment of social programs is based on two principal criteria. Firstly, the 'coverage ratio' represents the share of the population in a given quintile that receives a given social service. In the context of the bottom quintile, this can be thought of as the share of the poor population that benefits from a given program. Thus, one minus the coverage ratio can be thought of as the 'error of exclusion': the poor people that are excluded from the program. The second criterion is referred to as the 'targeting ratio'. This is defined as the share of a given program's beneficiaries that fall within the bottom quintile (i.e., the proportion of recipients that are poor). Likewise, one minus the targeting ratio can be interpreted as the 'error of inclusion': the non-poor people that are included in the program. These assessment criteria are methodologically consistent; alas, from an empirical perspective, a few analytical caveats must be taken into account when interpreting the results.

9-3. Firstly, these criteria are premised on the assumption that the entire bottom quintile population are 'potential' recipients of the program. Of course this is not always the case. Consider the potential recipients of unemployment insurance or drought relief. Obviously, poor people who are employed or are non-farmers would not qualify for these respective programs. Whenever possible the 'potential' recipient population was identified (see Volume II, Chapter 9, Appendix Table 28), but this information was not available for all the programs considered. Secondly, the analysis assumes that the quality and cost of the services provided is the same across individuals and quintiles. However, typically services provided to the poor are less valuable and of lower quality. To the extent that this bias is systematic, what follows could be interpreted as a lower bound of the incidence of benefits or spending received by the poor. In addition to these problems, some of the data for certain programs was unavailable and occasionally assumptions had to be made to make all programs comparable. Consequently, the analysis should be interpreted as tentative and preliminary. Further work along the lines set out by von Amsberg is required before formulating definitive judgements about the incidence and effectiveness of social rural spending in Brazil.

9-4. The chapter presents a preliminary assessment the comparative effectiveness of the programs on the basis of the two aforementioned criteria and identifies priorities for rural poverty alleviation. A detailed overview of the principal social spending related to rural poverty alleviation is provided in von Amsberg as is discussion of what characteristics associated with each program have complicated the analysis.

A Comparative Assessment of Program Effectiveness

9-5. Figure 1 graphically compares the principal programs along three dimensions: each bubble represents one spending program; the size of each bubble is proportional to annual per

39 These headcount poverty rates are based on an extreme (food-only) poverty line of R$65 per capita per month in Sao Paulo Metropolitan areas prices.
household spending (annualized in the case of investment programs) showing the relative importance of the program to beneficiaries; the horizontal position of the bubble shows the level of targeting of the program to the bottom quintile: the vertical position of the bubble shows the reach (coverage ratio) of the program among the bottom quintile. For reference, the impact of distributionally neutral annual growth of 4% is shown in the top left-hand corner. Programs in the lower left corner are poorly targeted and do not reach many of the poor (pensions, urban services, secondary education, and credit). Programs in the bottom right-hand corner are those well-targeted, but only reaching a small share of the poor (land reform). Programs near the top left are universal (basic health, education, and school lunches). The “ideal” social program is located in the top right-hand corner and are both well targeted and reach a large share of the poor. The two programs that apply only to the Northeast—i.e., Drought relief and the Rural Poverty Alleviation Projects (RPAPs)—come close to this criterion. To some extend the targeting and coverage positions of these two programs vis-à-vis the other programs (which are based on all of rural Brazil) is due to the overwhelming amount of rural poor in the Northeast.

9-6. Overall, social spending in the rural Northeast is very progressive compared to total social spending in rural Brazil. This is because the poverty rate is so much higher in rural Northeastern areas and thus a less intensive targeting effort is necessary for bringing a larger share of the benefits to the poor. By extension, total social spending in rural Brazil also has a larger poverty reducing effect than social spending overall because of the higher poverty rates in rural versus urban areas. This would suggest, on the margin, that increasing rural social spending more than urban social spending would have a greater effect on poverty reduction. Moreover, given the higher poverty rate in rural areas, rural social spending is also significantly more cost effective. In fact, von Amsberg reports finds that some social programs (including mostly non-contributory rural pensions) do not appear to meet the cost-effectiveness test against untargeted transfers.

9-7. Figure 1 suggests a trade-off between poverty targeting and coverage. The more complete the reach to the poor, the more difficult it is to control leakage. This is the challenge faced in up-scaling small and well-targeted social development programs. The challenge is to either reallocate funds from programs with inadequate reach and targeting to programs further away from the top left-hand corner, or to redesign existing programs such that they move toward the top right corner, representing better targeting and wider reach among the poor. A second trade-off that emerges is one between benefit size and coverage. Expensive programs, like land reform, reach only a small number of the poor, while cheaper programs, such as the RPAP, can afford larger coverage.

9-8. Table 8 offers another perspective by comparing the number of poor beneficiaries that could be obtained from the alternative use of R$1 million in different social programs. For example, a policy maker who can spend an additional R$1 million on social programs in rural areas can chose between including another 40 families (34 of which are poor) in the land reform program; bringing school lunches to another 25,000 children (10,250 of which are poor) for one year; or connecting another 2,000 households (300 of which are poor) to piped water.

40 The data is provided by von Amsberg (Chapter 9, Volume II) in Table 9.21 and the underlying assumptions and sources used to compute these numbers are summarized in Table 9.28.

41 Thus, if for each of the programs the coverage and targeting ratio’s would be regionally disaggregated, in the Northeast identical programs would be better targeted compared to the say the Southeast (targeting and coverage performances of programs is critically affected by the geographic heterogeneity in poverty rates). Finally, note that the poverty line on which the poverty rate estimates are based also affect the ‘performance’ of program’s and that this analysis is based on an ‘extreme’ poverty line (if the poverty line is increased, then headcount poverty rates rise and thus it becomes easier to reach the poor).
The analysis presented here is instructive and permits the quantitative comparison of a wide range of very diverse social programs. However, the preceding analysis of the cost effectiveness between different rural social programs requires several rather strong assumptions to fill data gaps and make different programs comparable and limitations need to be addressed before drawing simplistic and premature policy conclusions from this analysis. The analysis serves as a departure point for further in-depth analysis.

Table 8. Benefits from R$1 Million Spending in Different Programs

<table>
<thead>
<tr>
<th>Benefit for R$1 million Budget Spending</th>
<th>Total Beneficiaries</th>
<th>Poor Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households in Land Reform Program</td>
<td>40</td>
<td>34</td>
</tr>
<tr>
<td>Households with RPAP</td>
<td>1429</td>
<td>1000</td>
</tr>
<tr>
<td>Temporary Drought Workfare Jobs</td>
<td>1429</td>
<td>1071</td>
</tr>
<tr>
<td>Children in Primary School</td>
<td>3175</td>
<td>1429</td>
</tr>
<tr>
<td>Children with School Lunch</td>
<td>25000</td>
<td>10250</td>
</tr>
<tr>
<td>Households Covered with Basic Health</td>
<td>3344</td>
<td>1037</td>
</tr>
<tr>
<td>PRONAF Loans</td>
<td>435</td>
<td>109</td>
</tr>
<tr>
<td>Households Connected to Electricity</td>
<td>1429</td>
<td>259</td>
</tr>
<tr>
<td>Children in Secondary School</td>
<td>3175</td>
<td>540</td>
</tr>
<tr>
<td>Households Connected to Piped Water</td>
<td>2000</td>
<td>300</td>
</tr>
<tr>
<td>Pension Recipients</td>
<td>583</td>
<td>76</td>
</tr>
</tbody>
</table>

Source: von Amsberg (Chapter 9, Volume II)
9-10. The analysis ranks programs by their effectiveness to transfer resources to the poor. Of course, many of the analyzed programs have additional objectives that would need to be considered in a more comprehensive evaluation. Many investment programs also have a growth objective. Thus, low effectiveness in transferring resources to the poor does not necessarily imply that a program should be abandoned. However, low effectiveness does imply that a program should not be a priority for the reduction of rural poverty and should not be justified on such grounds. For several programs, non-monetary benefits for the poor are difficult to measure and the assumed benefit-cost ratio may well underestimate the benefits of several programs. Finally, targeting typically refers to average spending in the recent past. New and additional spending may, however, have a different incidence. For example, the average targeting of sewage investments in the past has been very regressive. However, as coverage of the better-off population increases, additional investment may be better targeted.

42 For example, programs, such as social security and unemployment insurance, have an insurance function regardless their social objectives.)