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Brazil

The Management of Agriculture, Rural Development and Natural Resources

(In Two Volumes) Volume I: Summary

July 31, 1994

Natural Resource Management and Rural Poverty Division
Country Department I
Latin America and the Caribbean Region

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ABSTRACT

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Abstract:

This report is about the management of agriculture in Brazil, the natural resources of Brazil, and the people who live in rural Brazil. It surveys and analyses the policies that the government has adopted toward this interactive complex. And it suggests modifications in those policies that would better achieve the three goals that the government wishes to achieve with its policies. These goals are:

- vigorous growth in agriculture
- reduction in rural poverty
- sustainable use of natural resources

Brazil has undertaken major institutional and economic reforms over the last few years. Many in agriculture and natural resource management. But the process is incomplete and the hard-won gains are in danger of reversal if reforms are not completed. Further, a number of policies put in place in the past have outlived their usefulness or are having unintended side effects that are costly to agricultural growth and rural development. In other cases the type of intervention seems inappropriate.

This report documents a large number of interventions used by the government to manage agriculture, rural development and natural resource use. It comments on the appropriateness of each and, where appropriate, suggests alternatives. The broad view taken by the report allows it to identify outcomes that cut across the different goals of policy so that interactions between policies and concerns that are systemic can be identified.

Important findings are that agriculture is now not paying its share of income tax; that public expenditures in the sector need redirecting to satisfy the criteria of public goods, market failure and environmental protection; that there is an emphasis on rules and regulations to control private activity and an absence of incentives to accomplish the same; that many regulations unintentionally produce biases against the use of labor on farms and encourage large-scale, capital-intensive farming; and that greater emphasis needs to be given to conservation and forestry concerns including clearly distinguishing between native and plantation forestry.

ABBREVIATIONS

AGF	<i>Aquisições do Governo Federal</i> Federal Government Acquisition (Minimum Price Program)
APCR	<i>Apoio a Pequenas Comunidades Rurais</i> Support (or Assistance) to Small Communities-Community Participation Component of PAPP
BASA	<i>Banco da Amazonia S.A.</i>
BNB	<i>Banco do Nordeste do Brasil</i> Northeast Bank of Brazil
BNDES	<i>Banco Nacional de Desenvolvimento</i> National Development Bank
DNAEE	National Department for Water and Electrical Energy
EGF	<i>Empréstimo do Governo Federal</i> Federal Government Loans (Minimum Price Program)
EMBRAPA	<i>Empresa Brasileira de Pesquisa Agropecuária</i> Brazilian Agricultural Research Agency
FINAME	<i>Agencia Especial de Financiamento Industrial</i>
FINSOCIAL	Tax on Wages
FNE	Constitutional Financing Fund of the Northeast
FNS	National Health Fund
FPM	Municipal Participation Fund
FPM	Municipal Participation Fund
FUNAI	<i>Fundação Nacional do Índio</i> National Indian Foundation
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IAA	<i>Instituto de Açúcar e do Alcool</i> Sugar and Alcohol Institute
IAPAR	<i>Instituto Agronômico do Paraná</i> Agricultural Research Institute of Parana

IBAMA	<i>Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis</i> National Institute for the Environment
ICMS	<i>Imposto Sobre Operações Relativas à Circulação de Mercadorias</i> Tax on the Circulation of Goods
INCRA	<i>Instituto Nacional de Colonização e Reforma Agrária</i> National Institute of Colonization and Agrarian Reform
IPI	Industrial Products Tax
IPM	Integrated Pest Management
ISI	Municipal Service Tax
ITR	<i>Estatuto de Terra</i> Land Tax
MERCOSUL	<i>Mercado Comum do Sul</i> Common Market for Argentina, Brazil, Uruguay and Paraguay
NGO	Nongovernmental Organization
NWRMS	National Water Resource Management System
OECD	Organization for Economic Cooperation and Development
PAPP	<i>Programa de Apoio para o Pequeno Produtor</i> Program of Assistance to the Small Farmer
PETROBRAS	<i>Petróleo Brasileiro, S.A.</i>
POLONORDESTE	<i>Programa de Desenvolvimento de Areas Integradas do Nordeste</i> Program of Integrated Development for the Northeast
PROALCOOL	<i>Programa Nacional de Alcool</i> National Alcohol Program
PROCERA	<i>Programa Especial de Crédito para a Reforma Agrária</i>
QR	Quantitative Restrictions
SIR	Secretariat of Irrigation
SNCR	<i>Sistema Nacional de Crédito Rural</i>
SUDENE	<i>Superintendência do Desenvolvimento do Nordeste</i> Superintendency for Development of the Northeast

SUS	<i>Sistema Unico de Saúde</i>
TR	<i>Taxa Referencial</i> Official Monthly Index to Adjust for Inflation
TRD	<i>Taxa Referencial Diária</i> Official Daily Index to Adjust for Inflation
VAT	Value-Added Tax

CONTENTS

Abbreviations

Preface	i
Issues and Recommendations	ii
Introduction	xiv

1	Macroeconomic Factors Affecting Agriculture and Natural Resource Management	1
2	Trade Reform and the Price Regime	3
	Imports	3
	Exports	4
	Exchange Rate Policies	5
	Need for Related Reforms	5
	Recommendations	6
3	Sugar/Ethanol Policy	7
	Getting Policy Right	8
	What a Better Policy Means for Brazil and the World	9
	Recommendations	11
4	Public Finance	12
	Fiscal Issues	12
	Agricultural Taxation and Incentives to Invest, Employ Labor and Buy Land	12
	Income Tax	12
	Land Tax (ITR)	13
	Sales and Value Added Taxes	13
	Social Security and Payroll Taxes	13
	Salario Educação	14
	Government Spending on Agriculture, Natural Resources and Rural Development	15

This report is based on the findings of a World Bank team which visited Brazil in September and November 1992 and discussed findings with the Government in October 1993. The core team are: Malcolm Bale (task manager), Hans Binawanger, Kreszentia Duer, Robert Kaplan, David Nielson, David Steeds and Alberto Valdes. Others contributed sections or background papers. Within the Bank, they are: Tulio Barbosa (land markets); Luis Constantino, Daniel Gross (natural resources); Chelikh Kane (social security); Elizabeth Katz (rural development and rural poverty); Bert Kramer (water); Cesar Plaza (agrochemicals); and Eugene Verduynsen (credit). Consultants are: Basilia Aguirre (rural labor markets); Brent Borrell; Jose Reinaldo del Bianco (sugar/ethanol); Jose Luis Carvalho (rural credit); Geraldo Sant'Ana de Barros, Neide Almeida Beres, Paulo Cesar Malheiros, Roberto Figueiredo Guimarães (public finance); Henrique Monteiro de Barros, Ponciano Cavalcanti, Magdalena Rodrigues dos Santos (rural development); Guilherme Dias (regional comparative advantage); Roger Fox (land markets); Simon Hocombe, FAO (soil conservation); Mauro de Rezende Lopes (agricultural policy); Thomas Olsen (agricultural growth); Maria Teresa Padua, Eneas Salati, Jeffrey Ritchie, Antonio Dias Leite, Sylvio Péllico Netto, Eustaquio Reis, Philippe Lena (national resource management); and Yoni Sampaio (nutrition). The formal peer reviewers are Antonio Salazar Brandao (Getulio Vargas Foundation) and Emilio Moran (Indiana University). The task manager wishes to acknowledge financial assistance provided by Bundesministerium für Wirtschaftliche Zusammenarbeit (BMZ), Federal Republic of Germany.

	An Operational Framework	15
	Market Interventions	16
	Public Goods	16
	Targeted Poverty Programs	17
	Administration	17
	Assignment of Responsibilities, Taxes and Revenues	18
	Assignment of Responsibilities	18
	Tax Assignment and Revenue Sharing	18
	Specific Purpose, Conditional or Negotiated Transfers	19
	Recommendations	20
5	Agricultural Research and Extension	22
	Budgetary Constraints	22
	Prioritization of Public Research/Extension	22
	Particular Needs of Poor Farmers	23
	Relevance of the Agricultural Research/Extensio	23
	Linkages Between Institutions	24
	Recommendations	25
6	Rural Credit	26
	Credit at Preferential Rates	27
	Non-Bank Rural Credit at Market Rates	28
	Special Regional Programs and Funds	29
	Recommendations	30
7	Land Markets and Land Ownership	31
	Policy Update	31
	Recommendations	35
8	Small Farmer Agriculture, Rural Development, and Social Services for the Rural Poor	36
	Small Farms and Rural Development	37
	Social Services for the Rural Poor	38
	Health	38
	Education	39
	Nutrition	39
	Findings	40
	A Vision for Farming and Development	41
	Recommendations	43
9	Conservation, Forestry and Biodiversity	44
	Conservation	44
	Management of Protected Areas	45
	Untapped External Financial Resources	45
	Land Purchase for Protected Areas	45

Production Forestry	46
Native and Plantation Forests	46
Ineffective Regulations	46
Targeted Incentives for Reforestation	46
Alternative Forest Management Regimes	47
Pricing of Extracted Logs	47
Amazon	47
Road Construction	47
Unallocated Land	48
Indigenous Communities	48
Property Rights	48
Conclusion	48
Recommendations	49
10 Sustainable Agriculture	51
Soil Erosion and Land Degradation	51
Current Problems	51
Current Solutions	52
Current Needs	52
Policy Implications	53
Water Utilization	53
Agrochemicals	54
Recommendations	56
Annex A Balance Sheet	57
Annex B Advisory Panel on Agriculture and Natural Resource Policy	63

PREFACE

This report covers a broad and complex set of topics ranging from commercial agriculture and natural resource management to social issues in the rural sector. It was undertaken by a large team of Bank staff and Brazilian experts.

Because of the breadth and detail of the report, its presentation has provided a challenge. How can such a wealth of material be made accessible to the diverse audiences interested in at least parts of it, without losing detail and economic rigor? How can recommendations be made in a summary form that will be accessible to policymakers without appearing superficial and unreasoned? This challenge has been met by presenting the material in three forms, viz:

- **A tabulation of the issues and recommendations follows immediately. This information will be useful to the reader who wishes only a highly abbreviated overview of the findings of the report.**
- **A summary report (Volume I) then follows. This volume provides brief explanations of the issues and brief reasoning for the recommendations. The issues and recommendations for each topic are tabulated at the end of each chapter. Virtually all the references to literature and cross-references to Volume II are suppressed. Volume I is intended as a somewhat detailed summary, but not as a substitute for Volume II.**
- **Volume II parallels Volume I in topic content but provides full argumentation, tables and figures, and references to the literature. Readers of Volume I wishing further detail or justification will turn to the same section of Volume II.**

The report is the result of a close collaboration between Bank staff and Brazilian experts. Not only did Brazilian collaborators provide background papers but a panel of experts was constituted to advise and guide the work as it progressed. Three workshops were held with the panel: in September 1992, to identify the key issues to be studied; in November 1992, to review the preliminary findings; and in June 1993, to review the penultimate report. The membership of the Advisory Panel is provided in Annex B. Four dissemination/discussion workshops were also held in addition to the formal discussion of the report with the Government in October 1993. These workshops were: Environmental Policy, in Sao Paulo in June 1994; Sugar and Ethanol Policy in Sao Paulo in June 1994; Commercial Agriculture Policy in Brasilia in conjunction with the SOBER meetings in July 1994; and Rural Development and Poverty in Fortaleza in August 1994.

ISSUES AND RECOMMENDATIONS

MACROECONOMIC FACTORS

ISSUES

1. Many agriculture and natural resource reforms cannot be completed without macroeconomic stability. High inflation is confusing price signals, undermining the financial system, and eroding the financial and institutional capacity. Essential public services are losing qualified staff.

RECOMMENDATIONS

Macroeconomic stabilization is of the highest priority for the development of many sectors, including agriculture and natural resource management.

2. Macroeconomic instability is likely to interfere with implementation of agricultural agreements within MERCOSUL as macroeconomic instability leads to large fluctuations of real exchange rates and hence, trade flows, while fundamental attributes are unchanged. Relative exchange rates and interest rates will determine trade flows in MERCOSUL rather than comparative advantage and competitiveness.

Macroeconomic stability is a prerequisite for a workable common market. In the absence of macroeconomic stability, mechanisms will need to be developed within the MERCOSUL negotiations to dampen large and unpredictable trade flows driven by the macroeconomic instability.

TRADE AND PRICE REGIME

ISSUES

1. While progress on trade reform has been impressive, delays in completing the process are costly.
2. Imports of agricultural machinery and equipment are still excessively protected.
3. Even though not fully used, the instruments of government intervention in commodity markets, such as consumer price controls and minimum producer prices, are still in place.
4. There is an increasing inconsistency between the price support system/minimum price program and tariffs.
5. Existing price stabilization schemes for agricultural commodities are still excessively based on physical storage.
6. Markets for hedging price risks are still underdeveloped even though they are needed much more now. Alternative mechanisms and markets for hedging will not develop under policy inconsistencies. (See recommendation 4)
7. Anti-dumping and countervailing duty rules and implementation capacity remain undeveloped, even though the importance of these has greatly increased under a tariff-based regime.
8. While port costs are only one component of export costs, they are among the highest in the world. High port costs are an implicit tax on exports, of which agriculture is a big part.

RECOMMENDATIONS

- The Government should reaffirm its commitment to speedily complete the trade reform.
- Import tariffs should be unified under the standard industry categories of protection (20 percent is about double protection provided to agriculture and other industries).
- A commitment to remove instruments of interventions. As new policies are implemented, old instruments should be eliminated.
- This inconsistency opens an opportunity to revise price intervention. As a first-best, most price supports should be removed. Otherwise imports will bankrupt the support schemes. If any remain, then consistency of stabilization mechanisms with world market behavior must be ensured.
- Since physical storage is an expensive way of providing protection against price instability in world markets, Brazil should set aside foreign currency reserves to deal with international price instability of staple agricultural importables.
- Remaining policy and regulatory barriers to the development of hedging mechanisms should be removed. The bonded warehousing system needs to be strengthened and an explicit policy to allow the private sector to develop new commodity hedging instruments should be announced.
- The anti-dumping and countervailing duty rules need to be modernized and made GATT-consistent, and the monitoring capacity needs to be reassessed and adjusted.
- High port costs appear to be caused in large part by government-sanctioned labor regulations that should be addressed by the government.

SUGAR/ETHANOL POLICY

RECOMMENDATIONS

Domestic prices for both sugar and ethanol should be based on world prices, and export taxes abolished. Brazil should attempt to capture higher export revenues by deregulating the sugar/ethanol industries and by promoting the use of ethanol as an octane-enhancer. Greater emphasis should be given in trade negotiations to the removal of trade barriers on both sugar and ethanol.

A modified sugar policy would have immediate benefits for sugar producers and consumers. All plant quotas on sugar and ethanol should be removed. Those parts of PETROBRAS dealing with the sugar industry should be privatized as the fuel distribution, import activities, and other subsidiaries are spun off. Cost-based pricing should be dropped, in favor of market-determined prices to maintain a dynamic and competitive industry.

ISSUES

1. Present sugar/ethanol policies impose an opportunity cost of \$600 million to \$2.5 billion a year by failing to exploit Brazil's comparative advantage in sugar production and forcing conversion of sugar into ethanol. Failure to respond to improving opportunities to export sugar has raised the social cost of the sugar/ethanol policy. Failure to recognize and promote export opportunities of ethanol as an environmentally-friendly octane-enhancer increases costs of the program.
2. The policy emphasis on quantitative controls in the sugar/ethanol industries remains fully intact. Restrictions on entry into the sugar industry remain. Sugar and ethanol prices are set without reference to world prices. Ethanol is not being used in Brazil as an environmentally-beneficial octane-enhancer of gasoline. Pricing is based on costs of ethanol production which limits efficiency gains in the industry.

PUBLIC FINANCE

ISSUES

RECOMMENDATIONS

Revenue Side

1. Now that implicit taxation via exchange rate and trade regime has been eliminated, the tax load of the agriculture sector is low.
Equalize fully the treatment of agriculture in the income tax code by eliminating all special "rural" rules.
2. Immediate write-off of fixed agricultural investment has defeated the intention of agricultural income-tax reform.
Adopt depreciation schedules that reflect internationally accepted standards for the various fixed investments.
3. Corporate tax rate of agricultural income is lower than for non-agricultural income, encouraging "verticalization". There is little basis for differential corporate tax rates.
Corporate tax rate on agriculture should be aligned with nonagricultural tax rate.
4. A special agricultural deposit scheme has been introduced which allows avoidance of income tax.
Eliminate the scheme.
5. ICMS still discriminate against exports and distort inter-regional allocation of production.
Ideally, change ICMS from an *origin* to a *destination* principle, thereby eliminating differential impact on production decisions. If administratively impossible, retain the origin tax with distribution of revenue on a destination basis. After achieving equal treatment of agricultural income in the income tax code, allow for drawback of ICMS of agricultural exports.
6. Collection of land taxes remains minimal because of insufficient willingness to pay, and progressivity of the tax rate is excessive. The progressivity is nullified by special exemptions for farms under crops or using modern technology.
Increase willingness to pay by assigning the entire land tax revenue to municipalities. Also, reduce the progressivity of the land tax rate, eliminate the exceptions for progressivity and leave only the homestead exemption.
7. Financing of primary education out of a payroll tax remains inappropriate because there is no link between payers and beneficiaries and this tax raises the cost of employment.
In general, earmarked taxes are undesirable and there are many in Brazil. Abolish the tax (*salario educaçào*). Replace it with general revenues from by broadening the base of the income tax.
8. Shift of the agricultural social security tax from an output to a wage tax has made it virtually uncollectible and introduced a distortion against labor and labor-intensive crops.
Restore the original social security tax, via output tax or a surtax on ICMS.
9. The revenue sharing system maintains or improves inter-regional income equalization but reduces incentives for own-revenue generation of the states and municipalities.
Consider introducing a mechanism in the revenue sharing formula which rewards improvements in the fiscal efforts of states and municipalities.

Expenditure Side

10. Federal expenditures for rural areas contribute only marginally to interregional equity and poverty reduction. Spending is not well targeted to growth-enhancing public goods, nor to the reduction of environmental externalities.
The Government should link its remaining rural expenditures to activities that reduce rural poverty, enhance public goods and reduce environmental externalities. Spending and cost-sharing also need to be better targeted.

PUBLIC FINANCE (Continued)

ISSUES

RECOMMENDATIONS

11. Federal expenditures on agriculture and natural resources amount to over \$9 billion per year, of which almost half goes to agricultural market interventions (pricing and marketing, marketing boards, credit) and 15 percent to land reform. Less than 3 percent is allocated to environmental protection.

A major redirection of agricultural and natural resource expenditures should be considered, focusing government spending on public goods and market failures, and withdrawing spending from activities better suited to the private sector. Spending on market interventions should be greatly reduced. A market-assisted land reform program would be more cost-effective. More resources could be reallocated to environmental protection and research.
12. In general, federal transfers to states and municipalities are untied and do not require matching commitments.

The federal government is foregoing an opportunity to implement policy by not tying grants to specific activities. Local commitment to these policies would be further strengthened by requiring matching finance by the state or local government.
13. State and municipal expenditures for health, education and water supply are also not targeted to the rural poor.

Develop mechanisms that encourage states to better target their spending to the rural poor and the environment.
14. No transfer mechanisms for fiscal resources to small rural communities exist for productive investment or social services.

Design a strategy to target federal and state funds to poor rural communities and municipalities for small-scale productive, infrastructural and social investments, in which local beneficiary organizations would be responsible for the selection, execution, operation and maintenance of projects. Criteria should include: transparent, participatory and representative decision-making, and built-in mechanisms for auditing, monitoring, evaluation, and cost recovery. Targeting should take into account both the poverty of the community and the poverty-reduction characteristics of projects. For complex projects, line-agencies should retain permit authority to assure the technical integrity of the projects.
15. Convoluted and leaky transfer mechanisms continue to exist for educational finance.

Reduce negotiated transfers unrelated to the aims of improving access to (and quality of) basic rural education.
16. Vague criteria for receiving health funds from FNS has politicized resource allocation.

Federal matching grants should be used to direct state and municipal health expenditures towards the provision of rural primary health care, with an emphasis on maternal and child health and nutrition.
17. Public sector regulations constrain the contracting to private sector, communities, and NGOs, of executing functions in conservation, agricultural development and delivery of social services

The government should design its policy and regulations concerning "contracting out" of service and execution so that alternative organizations, including NGOs, can undertake these functions.
18. Rural road construction (non-frontier) and maintenance has declined, despite their contribution to agricultural growth.

The increase in land tax, resulting from its reform and reassignment to municipalities, should be used partly to finance road work. Targeting of state expenditures to poorer rural communities will help rectify the decline in road construction and maintenance.

AGRICULTURAL RESEARCH AND EXTENSION

ISSUES

RECOMMENDATIONS

1. Both the public research and the public extension systems are depleted from years of budgetary crisis. Size and quality of staff are declining. Facilities are not being maintained. Investment in new facilities is non-existent. Day-to-day operational expenses cannot be covered.
2. There is a lack of linkages between the institutions which provide research and extension services - EMBRAPA, universities, state level research and extension services, private sector.
3. There is no mechanism to ensure that public research or public extension are demand-driven. Consequently, capable researchers and extension agents in the public sector are seen as irrelevant by the producers.

These institutions should be made more autonomous so that salary restrictions could be lifted and other funding sources mobilized more fully. Strict criteria should be employed to prioritize publicly funded research, based on growth-enhancing public goods, environmental externalities and potential impact on poverty reduction. Research activities which can profitably be financed by the private sector should not be underwritten by the very limited public budget. For privately profitable research activities executed under contract by the public sector, full cost recovery should be sought. Extension services should be on a for-pay basis, even if part of the funding for these services is ultimately provided publicly (e.g., a voucher system). Criteria for partial or full public funding of extension can be based on the same criteria as research.

Lift constraints to joint appointments in institutions involved in research and extension. Develop joint research and extension projects across institutions. Matching-fund incentives, linked to public goods, externalities, poverty reduction objectives, should be used to help accomplish this.

Decentralize the operational management of extension services to the municipal level and give producers greater roles in the control and evaluation of extension services. The process for setting research priorities should include representatives of the producers and other private sector participants. EMBRAPA and each of its research stations should have boards composed of stakeholders (including small farmers, consumers, cooperatives, and producer groups).

RURAL CREDIT

ISSUES

1. Agreement has been reached in principle on removing subsidized credit for agriculture but there is no strategy nor political commitment. Working capital under the program is mainly going to a few large farmers and agro-processors. The present credit program contributes to the maldistribution of farm income and is unnecessary as farm financing is being found through alternative channels by the large majority of farmers.
2. Credit for capital equipment provided under FINAME is now available to the agricultural sector thereby making agriculture more capital intensive and further biasing agriculture against labor. While agriculture is now treated identically to industry for investment credit, both are receiving subsidized credit.
3. There is no institutional framework to support savings mobilization from (and credit availability for) small producers, such as credit unions, cooperatives, and small producers and entrepreneurs in rural areas.

RECOMMENDATIONS

- The current agricultural credit program should be replaced by a scheme to underwrite the transaction costs of credit provided by private commercial banks to small farmers.
- There is little economic justification for the preferential interest rate under FINAME. It should be progressively raised to at least the government's opportunity cost of funds - and then phased out.
- Re-examine the regulatory framework and modify it to allow for the development of private rural financial intermediaries. Develop a program to encourage the development of private financial intermediation for small farmers and small rural entrepreneurs.

LAND MARKETS AND LAND OWNERSHIP

ISSUES

1. Loopholes in the income tax code exempting agricultural income from income tax are capitalised into land values, thereby decreasing the accessibility of land to the poor.

2. Land allocation and titling rules still encourage deforestation.

3. The fiscal and administrative capacity of the government to distribute land to the rural poor has diminished. The administrative procedures where government first buys land and then distributes it to beneficiaries are excessively time-consuming and costly.

4. Remaining public land suitable for agriculture is not allocated explicitly to small farmers, due in part to past controversies surrounding settlements in Rondonia.

5. Without removing existing distortions against small farmers in land, labor, credit and tax policies, land rental and sales markets will not redistribute land toward smaller, efficient farms.

RECOMMENDATIONS

Close all loopholes in the income tax code.

Remove the remaining rules so that incentives to clear land as a way of demonstrating possession are eliminated.

Providing adequate fiscal resources are available, the government needs to redesign the land reform program to a market-assisted one, where poor private communities are assisted in buying land directly from private sellers. Worldwide experience with such schemes could be tailored to the needs of Brazil. The government would finance a part of the cost of land purchase and technical assistance.

The government needs to reexamine opportunities to allocate remaining public lands with clear agricultural potential to smallholder settlement, using simplified administrative procedures relying more strongly on community self-management.

These distortions against smallholder agriculture need to be removed as a precursor to any meaningful redistribution of land.

SMALL FARM AGRICULTURE, RURAL DEVELOPMENT, AND SOCIAL SERVICES FOR THE RURAL POOR

ISSUES

1. Land and labor laws, income tax, credit subsidies, and many regulations still reduce employment and self-employment opportunities in agriculture and total factor productivity. These negative effects on rural opportunities and rural development dwarf the positive efforts of all directed rural development programs.

2. The accessibility, coverage and quality of rural education is limited by: public financing mechanisms that discriminate against poor municipalities; low salaries and problematic hiring procedures for teachers; and the lack of a comprehensive strategy for rural education.

3. Public health and nutrition programs have not succeeded in targeting the rural poor and high-risk groups; due in part to discretionary financing mechanisms and in part to ineffective delivery.

4. Community initiatives continue to be constrained by highly paternalistic fiscal and implementation mechanisms.

RECOMMENDATIONS

Laws, regulations and incentives should be designed to be neutral with respect to input usage. For rural social security, payments should be based on output. The direct and indirect legal and regulatory biases against labor in the tenancy laws, the tax code, the labor legislation, and the credit subsidies should be eliminated.

The Federal Government, together with states and municipalities, should develop a strategy for rural education utilizing a matching grants program linked to monitorable and measurable improvements in the accessibility, coverage and quality of primary rural education. Based on the experience of the urban community schools movement, the potential role of parents' or other community-level associations and NGOs in the management of publicly-funded rural schools should be explored.

Federal financing of health and nutrition services should promote interregional equality and rely less on negotiated transfers. Ceara's positive experience with community-based health workers should be adapted in other states.

Resources transfer mechanisms should be designed to stimulate the ability of small communities to select, implement and administer a range of development projects, including productive investments, health and sanitation, education and infrastructure. Beneficiary contributions to such projects is essential. Cost recovery and operation and maintenance responsibility at the community level is also essential.

CONSERVATION, FORESTRY AND BIODIVERSITY

ISSUES

RECOMMENDATIONS

Forestry

1. There are no objectively determined priorities based on ecological values and degree of threat for allocating limited budgetary resources to conserving different ecosystems.
The Government should convene independent panels of experts to define and assign tentative scores for the ecological value and degree of threat to different ecosystems. Government could then use these scores to determine priorities for allocation of federal expenditures to these ecosystems.
2. Management of conservation units remains poor.
Develop procedures for contracting conservation NGOs, the private sector, states and *municipios* or community groups to carry out selected management functions in conservation units.
3. Available external financial resources for nature conservation are not being spent because of insufficient allocation (or erosion) of counterpart funds, management discontinuities and excessive administrative bureaucracy, primarily in IBAMA.
Commit adequate counterpart funds. Identify and eliminate excessive bureaucratic procedures. IBAMA's institutional structure and the skill mix and location of its staff need to be adapted to a new emphasis on policy formulation, contracting and supervision, and monitoring and evaluation.
4. There is no domestic finance to buy land for conservation units.
Define when land purchase is necessary for nature conservation and allocate budgetary resources to purchase land in accordance with nature conservation priorities.
5. Land in native forests is still subject to higher land tax than deforested land.
Land tax rates for forest should be the same as agricultural land. Forest land with known externalities, should have a low or zero tax.
6. Cost recovery in national parks remains minimal.
User fees should be adjusted to appropriate levels; collection should be tightened; and incentives for these changes should be provided by allowing each park to retain a share of the receipts it collects.

Production Forestry

7. Forest legislation does not distinguish between native and plantation forests.
Rules and regulations should clearly distinguish between, and treat differently, native and plantation forests.
8. Several overreaching or unenforceable forestry regulations are in place (e.g. property specific cutting regulations). While well-intentioned, they are blunt instruments to control deforestation since they are not closely tied to ecological objectives.
These regulations are not enforceable. Controls should be directly tied to environmental aims. More specific instruments that recognize topography as the defining principle (slopes, soil type, water-courses) for regulation and incentive purposes should be developed, and the old regulations should be dropped when adequate enforcement capacity is in place.

CONSERVATION, FORESTRY AND BIODIVERSITY
(Continued)

ISSUES

RECOMMENDATIONS

9. There are no targeted incentives to encourage reforestation on slopes and along water-courses where externalities are large. Reforestation cesses collected from users of forests are not spent effectively by the Federal government.

Conduct a study to identify the most cost-effective instruments to encourage reforestation of slopes and along water-courses. Retarget revenue from reforestation cesses so they can effectively support targeted incentives.

10. There are currently no alternatives to direct forest management by the government on public lands.

Undertake a study to determine alternative management regimes for public lands tailored to specific objectives and circumstances.

11. There is no producer price differential to discriminate against logs extracted in an unsustainable manner.

Develop systems which introduce a price differential, to create incentives for environmentally sound management.

Amazon

12. Road construction of states and municipalities in the Amazon is only partially under control.

Declare a moratorium on federal, state and municipal expenditure on road construction into areas zoned as not suitable for agricultural development. Develop enforcement mechanisms. Provide matching grants for strengthening environmental planning and enforcement at the state and municipal levels.

13. Assignment of *terra devoluta* to private use (including small-holder settlement), extractive reserves, indigenous communities, national forests, parks has not been completed.

Define a process for assigning remaining *terra devoluta* to alternative uses within five years. If any areas are to be for private use, define a settlement policy that takes into account the full environmental impact of forest conversion.

Indigenous Communities

15. Property rights to forest, water and mineral resources in Indian reserves are still undefined, leaving access essentially open and unregulated.

Assign clear property right to indigenous communities and assist them in developing and enforcing management policies based on contracts.

SUSTAINABLE AGRICULTURE

ISSUES

1. Some southern states have implemented land management plans on a micro-basin basis and this appears to have been effective. But there has been no further improvement in attention to sustainable land management issues since the mid-1980s.
2. Pesticide poisoning of equipment operators, and other farm workers, has not declined while monitoring and enforcement remain inadequate. Children are often used as operators and are particularly susceptible to long-term damage from poisoning.
3. Brazil has no policy and institutional framework for market exchange of water rights. Such a market is especially needed where water is scarce to encourage efficient water use in agriculture and urban industry.

RECOMMENDATIONS

- Other states need to undertake similar programs based on micro-basins. Further extension effort needs to be made in promoting low-tillage or no-tillage agriculture and other forms of on-farm conservation.
- Step up efforts on dissemination of the proper use and protection from pesticides, focussing on the detrimental effects on children. Alternative, less toxic, pesticides should be recommended to operators. Federal Government should define a strategy to selectively support better monitoring and enforcement at State level. Child labor laws should be enforced.
- The government should analyze the options available and establish a legal and institutional framework for market exchange of water rights.

INTRODUCTION

i. This report is about agriculture in Brazil, the natural resources of Brazil, and the people who live in rural Brazil. It surveys and analyses the policies that the Government has adopted towards this interactive complex. And it suggests modifications in those policies that would better achieve the goals that the Government wishes to achieve.

ii. Brazil has abundant and diverse natural resources. Almost the entire spectrum of ecosystems is represented—from tropical rainforests in the North, the semi-arid regions in the Center, to temperate areas in the South. Half of the Amazon rainforest, and the extensive wetlands of the Pantanal lie within Brazil. In recent years, these (and other natural resources) have come under increased pressure from users. Management of these fragile resource, the implications of agricultural policy on their use, and the welfare of people living there, is a concern of the government.

iii. Agriculture is equally diverse, ranging from tropical timber and foods to temperate crops and livestock, and is an important part of the economy accounting for 10 percent of GDP, 40 percent of export receipts, and 25 percent of employment. Brazil has a long history of intervention in agriculture. Outputs were taxed (explicitly and implicitly) and inputs were protected by import substitution. Large credit subsidies were used to offset these disincentives. Rapid agricultural growth, however, has neither reduced rural poverty nor stimulated employment. Rather, agricultural policy interventions, other policy distortions, and poor allocation of public expenditures have aggravated both.

iv. Initial policy changes were made in the late 1980s and the pace of reform increased under the Collor government. These included a more competitive exchange rate; liberalization of agricultural exports and imports; elimination of many interventions in agricultural marketing; promotion of risk management and finance for marketing; privatization of storage facilities; and reduction in subsidized agricultural credit, with higher real interest rates on remaining credit.

v. Concern with the environment and natural resource management, meantime, moved from rhetoric to action. In October 1988, the new national constitution included an advanced chapter on the environment and the government initiated an emergency program (*Nossa Natureza*) to protect the Amazon as well as other endangered ecosystems. A few months later, the National Institute for the Environment (IBAMA) was created to help coordinate environmental protection. In Rondonia and Mato Grosso, agro-ecological zoning was introduced to control infrastructure development and to demarcate conservation areas. In addition, fiscal incentives for migration and agricultural expansion into undeveloped areas were reduced and remaining ones were controlled.

Issues

vi. The pace of reform in agriculture and natural resource management in Brazil has quickened in recent years. But much more remains to be done. Indeed, reforms undertaken so far are in danger of reversal if left incomplete. Brazil needs to create a policy environment to allow vigorous growth of agriculture, while at the same time preserving the environment and reducing rural poverty. For forests to be used in a sustainable manner, policies must be modified and self-enforcement strengthened. To increase rural employment and reduce rural poverty, remaining anti-employment biases must be eliminated and policies and programs must be closely targeted to grass-roots, self-help delivery. While macroeconomic stability is a prerequisite for improved performance in agriculture, natural resource management and rural development, Brazil must consider its strategic options now, in anticipation of macroeconomic reform, to be able to respond in a timely manner. The main purpose of this report, therefore, is to advise the government on how to complete the policy reforms needed for increasing growth in agriculture, changing its pattern to be more neutral in labor intensity and poverty reduction, and increasing the sustainability of natural resource use.

Audience

vii. The primary audience are policymakers in the Ministry of Finance and the Ministry of Planning, insofar as the recommendations will deal with incentive regimes (trade, price, tax, rural finance) and the allocations of rural public expenditures. At the sectoral level, the audiences are the Ministries of Agriculture and of the Environment. State governors should be interested in the sections on natural resource management and rural poverty reduction. This work, too, should be a vehicle for dialogue and consensus-building among a broad spectrum of Brazilians interested in the future of agriculture, natural resources and rural development in Brazil.

viii. This project was undertaken in a way that is not typical for World Bank sector work. It was conceived as a broad sectoral synthesis built on earlier studies and a public finance review of agriculture and natural resources, that would be capable of identifying problems and issues common to many parts of the agriculture and natural resource complex. A panel of Brazilian experts advised Bank staff and consultants at several stages of the project.

ix. This volume is a summary. Only a brief explanation of the issues are presented followed by the specific recommendations, in tabular form. A policy balance sheet is presented as an appendix. Volume II closely parallels this volume in topic content, but provides more detailed economic analysis and argument. This report starts by briefly discussing macroeconomic stability and its effects on agriculture and natural resources. The following sections cover the need to complete the current reforms and

price policy; sugar/ethanol policy; public revenue and expenditure in agriculture and natural resource management; rural finance targeted to the rural poor; and research and extension. The final sections are on natural resource management and covers broad topics—the market for land; forests and forestry management; and the sustainability of soils, water and agrochemicals.

1. MACROECONOMIC FACTORS AFFECTING AGRICULTURE AND NATURAL RESOURCE MANAGEMENT

1.1 Macroeconomic instability in Brazil has a pervasive, deep and lasting effect on, among other things, agricultural development, protection of natural resources, and development in poor rural areas. Economic growth fell from 9.0 percent annually in the 1970s to 2.7 percent in the 1980s, so that more than a decade has passed without much improvement in the per capita standard of living. Poor economic policies distorted incentives. Investment and savings fell. Capital from abroad dried up. Inflation accelerated until consumer prices were increasing at 30 percent a month. Between 1986 and 1992, there were five attempts at adjustment. All failed.¹

1.2 Current stabilization efforts are having only limited success. Inflation continues at around 25 percent a month and output growth has been nearly zero, with most major sectors in decline. Government austerity targets (that is expenditure cuts in the face of falling revenues) have been difficult to achieve due to political uncertainty. High interest rates because of a tight monetary policy and the fiscal deficit, have crowded out private investment.

1.3 Failure to stabilize has led to distortions in relative prices and income distribution, misallocation of private resources, a drastic reduction in federal resources, and an undermining of the contract mechanism, the basis for private sector investment. Agriculture, rural development and the management of natural resources have all suffered.

1.4 In agriculture and agro-processing, investment has come to a virtual halt. Farmers and agro-processors are essentially "mining" their stock of capital. This is true not only for durable investments (such as tractors and farm machinery where sales have plummeted), but also for annual inputs (such as fertilizer and agrochemicals). With unpredictable inflation, the ban on indexation (monetary correction) has discouraged farmers and agro-processors from forward selling, made it difficult for input suppliers to provide credit to farmers, and undermined the nascent private storage industry.

1.5 Austerity has also cut back programs for rural development—primary education, targeted health interventions, rural roads and water supply, small farmer extension, and enforcement of farm safety regulations.

¹ Detailed analyses of the macroeconomic situation in Brazil are given in Brazil: Economic Stabilization with Structural Reforms, Report No. 8371-BR, The World Bank, 1991, and Brazil: A Macroeconomic Assessment, Report No. 11314-BR, The World Bank, 1992.

All have long term effects on productivity and welfare of the rural workforce and on rural to urban migration.

1.6 The lack of financial resources has severely limited the ability of Brazil to preserve (even threatened) ecosystems, to buy land for conservation, to enforce forestry and environmental regulations, and to design and implement better policies. Brazil cannot even use available multilateral funding for conservation because the staff of the implementing agency is so depleted. The capacity of many government agencies has declined.

MACROECONOMIC FACTORS

ISSUES

1. Many agriculture and natural resource reforms cannot be completed without macroeconomic stability. High inflation is confusing price signals, undermining the financial system, and eroding the financial and institutional capacity. Essential public services are losing qualified staff.
2. Macroeconomic instability is likely to interfere with implementation of agricultural agreements within MERCOSUL as macroeconomic instability leads to large fluctuations of real exchange rates and hence, trade flows, while fundamental attributes are unchanged. Relative exchange rates and interest rates will determine trade flows in MERCOSUL rather than comparative advantage and competitiveness.

RECOMMENDATIONS

Macroeconomic stabilization is of the highest priority for the development of many sectors, including agriculture and natural resource management.

Macroeconomic stability is a prerequisite for a workable common market. In the absence of macroeconomic stability, mechanisms will need to be developed within the MERCOSUL negotiations to dampen large and unpredictable trade flows driven by the macroeconomic instability.

2. TRADE REFORM AND THE PRICE REGIME²

2.1 Brazil initiated bold trade reforms in early 1990. What were those trade policy changes and how does the present regime affect trade and domestic prices in agricultural products?³

2.2 Direct agricultural price intervention has been a longstanding feature of agricultural policy. With the cut in credit subsidies in the mid-1980s, the Minimum Price Program (MPP) became a major form of government intervention in agricultural marketing. Through the government storage loan (EGF) and the government stock purchase program (AGF) at a guaranteed price, the government became a major player in the marketing of key agricultural commodities. Recently several adjustments have been introduced in these programs to reduce government expenditures. Because of the financial crisis in the government accounts, the availability of funds for the MPP program has fallen since 1988 and the government has been unable to meet its commitments under this program.

2.3 A comprehensive assessment of the effectiveness of the MPP is not available. But the MPP is likely to have inhibited the development of private market instruments for the major products. The AGF has inhibited the development of private storage operations and the EGF has inhibited the development of private financial services for commodity transactions.

2.4 The present circumstances—the trade reform, the de facto reduction in MPP operations, Brazil's agreements on policy harmonization under the MERCOSUL Treaty—offer a good opportunity to reassess what the role of the government should be in agricultural supply management. Most of the MPP could be phased out. But there is a clear need to define permanent rules for the role (if any) of the government in storage operations and a clear vision as to what the ground rules will be for private sector operations in domestic agricultural markets.

Imports

2.5 The main reform in the past two years was a move away from quantitative restrictions (QRs) towards tariffs. Tariff reductions began in 1988 but it was not until 1990 that the open trade strategy became effective. In 1990, QRs were removed. A year later, there began across-the-board

² See Chapter 2 of Volume II for full details.

³ Main sources are: Edicoes Aduaneiras, Tarifa Aduaneira do Brasil - TAB; Normas Administrativas na Importacao, Portaria Decex #8,13.05.91, and idem da Exportacao; World Bank, Brazil: Trade Sector Policies, Draft Aug. 92 (by C. Silva, LA1CO); Personal Communications (Kume, Carvalho, Valls, Pereira, Lopez, others).

tariff reductions and elimination of prohibited imports. The program ends in mid-1993, when there will be nine categories of tariffs, with a modal tariff of 20 percent, an average tariff of 14.2 percent, and a maximum tariff of 35 percent. This schedule represents a big reduction in the level and dispersion of tariff protection (the pre-reform modal tariff was 40 percent) and should substantially reduce anti-export bias.

2.6 There has also been further agricultural trade liberalization of farm products. State trade monopolies have been eliminated. So, too, have price controls on many agricultural products. In 1991, the government dismantled the wheat monopoly and eliminated the coffee and sugar monopolies. There is, however, still a special tariff on imports of fertilizers, pesticides and their raw materials; agricultural machinery is excessively protected; and the government's role in importing and storing strategic stocks is still excessive.

2.7 Anti-dumping and countervailing duty regulations are becoming more important, as the tariff rates decline and QRs are removed. Since 1987, Brazil had followed GATT rules and regulations on countervailing duty, although (partly because of high tariffs and QRs in the past) they were rarely used before the trade liberalization of 1990. GATT rules require proof of subsidy and of injury, which takes time. In 1991, Brazil introduced new legislation on countervailing duty (to reduce the time taken to resolve a dumping case) and additional legislation affecting agricultural products⁴. Once a case has been proven, any imports at prices below the mean average domestic price (wholesale) in the past five years will be taxed.⁵ GATT is reviewing Brazil's proposal.

2.8 Given the move to tariffs (and their reduction), anti-dumping/safeguard rules are likely to become a new trade barrier. They apply to all importables. A technical assessment of the current system in Brazil is suggested, so that its provisions are consistent with GATT and similar to those in other countries.

Exports

2.9 Brazil has come a long way on export liberalization. It has eliminated export taxes, as well as quotas and licenses, on most agricultural exports. There seem to be no export subsidies for agricultural products in Brazil. There are, however, indirect export subsidies through drawbacks and free trade zones (Manaus and Export Processing Zones) but which generally do not apply to agricultural commodities. Low quality coffee is subject to export restrictions. So, too, are raw tobacco and raw cashew nuts, although

⁴ Currently it takes about 45 days for the investigation and up to 20 days more to implement the anti-dumping duty.

⁵ Applies also to EEC products under the DFE trigger sale price of government stocks.

these are being liberalized. Export financing programs are also being withdrawn.

2.10 There are several indirect taxes on agricultural exports, including ICMS (a sort of state VAT). Farmers claim they can not obtain tax drawbacks if they export because they do not have legal accounting systems.⁶ And even if they did, taxes paid on inputs at harvest time would be reimbursed after harvest with no monetary correction. Further, drawbacks deal with duties in the last stages of production, while the ICMS (paid on both domestic and foreign sales) can not be drawn back on exports of raw (agricultural) products. Thus, raw agricultural exports receive discriminatory treatment. And, although ICMS on agricultural exports averaged 12 percent, the net figure could be as high as 25-30 percent due to the cascading effect of taxes on inputs. The drawback system needs to be made uniform so that the discriminatory treatment of raw exports is removed.⁷

Exchange Rate Policies

2.11 Brazil has a dual exchange rate system. One is the commercial rate for all trade, direct investment and capital flows; and the other is a (legal) parallel market tourist rate. In March 1990, the new government ended foreign exchange allocation and began gradual liberalization of the capital account.

2.12 Brazil's policy is to maintain a stable real exchange rate. The reduction in trade barriers on imports will help raise the real exchange rate, and improve the competitiveness of agriculture. The commercial exchange rate floats at roughly the market-determined tourist rate with intervention in the commercial market maintaining a target spread between the two rates. Between 1988 and 1991, the real exchange rate appreciated against the dollar by around 17% but remained stable in 1992.

Need for Related Reforms

2.13 Port users fees in Brazil are high. But a bigger burden may be the monopoly of the domestic merchant marine and restrictions on the use of foreign ships. This implicit trade tax raises costs significantly for agricultural exports.

⁶ Most producers of export crops are incorporated as companies. Therefore, this is not a strong argument.

⁷ As will be seen later, the agricultural sector pays very little tax in total. Thus the issue of importance is simply the discriminatory tax on raw product exports.

TRADE AND PRICE REGIME

ISSUES

1. Progress on trade reform has been impressive, delays in completing the process are costly.
2. Imports of agricultural machinery and equipment are still excessively protected.
3. Even though not fully used, the instruments of government intervention in commodity markets, such as consumer price controls and minimum producer prices, are still in place.
4. There is a potential inconsistency between the price support system/minimum price program and tariffs.
5. Existing price stabilization schemes for agricultural commodities are still excessively based on physical storage.
6. Markets for hedging price risks are still underdeveloped even though they are needed much more now. Alternative mechanisms and markets for hedging will not develop under policy inconsistencies. (See recommendation 4)
7. Safeguards, anti-dumping and countervailing duty rules and implementation capacity remain underdeveloped, even though the importance of these has greatly increased under a tariff-based regime.
8. While port costs are only one component of export costs, they are among the highest in the world. High port costs are an implicit tax on exports, of which agriculture is a big part.

RECOMMENDATIONS

- The Government should reaffirm its commitment to speedily complete the reform on (i) the fiscal system, in particular the ICMIS taxes, (ii) re-examine tariffs on tradable inputs, (iii) modernize the system of safeguards, countervailing duty and anti-dumping, and (iv) continue reforms in capital markets, labor taxes, deregulation of transportation, and promote the development of hedging instruments for the principal farm products.
- Import tariffs on tradable inputs should be unified under the standard industry categories of protection (20 percent is about double protection provided to agriculture and other industries).
- A commitment to remove instruments of intervention. As new policies are implemented, old instruments should be eliminated.
- This inconsistency opens an opportunity to revise price intervention. As a first-best, most price supports should be removed. Otherwise imports will bankrupt the support schemes. If any remain, their consistency of stabilizer-mechanisms with world market behavior must be ensured. However, price intervention at harvest time remain a real issue, particularly considering the current underdevelopment of private storage and credit systems.
- Since physical storage is an expensive way of providing protection against price instability in world markets, Brazil should set aside foreign currency reserves to deal with international price instability of staple agricultural imports/exports.
- Remaining policy and regulatory barriers to the development of hedging mechanisms should be removed. The bonded warehousing system needs to be strengthened and an explicit policy to allow the private sector to develop new commodity hedging instruments should be announced.
- The safeguard, anti-dumping and countervailing duty rules need to be modernized and made GATT-consistent, and the monitoring capacity needs to be reassessed and adjusted.
- High port costs appear to be caused in large part by government-sanctioned labor regulations that should be addressed by the government.

3. SUGAR/ETHANOL POLICY⁸

3.1 Brazil uses only a third of its cane for sugar production; the rest is used to produce ethanol, an automotive fuel. It is the world's most efficient (low cost) producer of sugarcane. It is also the largest—a massive 230 million tonnes of sugarcane per year. And Brazil's comparative advantage extends into sugar production, where it is the most efficient producer. It is not clear, however, that it has such an advantage in ethanol production.

3.2 Although impressive technically, ethanol production today costs more than 140 percent of the world price of gasoline. Even so, ethanol may be worth more in alternative uses. Only Brazil's policy arrangements force ethanol to be used as a gasoline substitute. In fact, it may have a greater comparative advantage if ethanol were used as an octane enhancer, and/or as a clean fuel.

3.3 The world sugar and ethanol markets are distorted, which limits Brazil's ability to exploit its comparative advantage. Import restrictions by developed countries reduce opportunities in both markets. Even so, there is much Brazil can do to make the most of those opportunities that exist.

3.4 Resource allocation in Brazil's sugarcane, sugar and ethanol industries reflects much intervention in those industries' markets. Through the PROALCOOL program, the government sought to reduce Brazil's reliance on imported fuel by promoting ethanol through subsidies to ethanol producers, car manufacturers and consumers alike. Commercial decisions about resource allocation (based on incentives and competition), have been swapped for a few (non-commercial) decisions made centrally by officials far removed from the opportunities of the market. Such decision making is unsuited to rapidly changing, uncertain and increasingly competitive international markets.

3.5 The reasoning behind the PROALCOOL program was that oil prices would remain at record highs, that Brazil's economy was vulnerable to shortages of automotive fuels, and that sugar prices would remain low. Not so. Oil prices have plummeted, Brazil has discovered big oil reserves (and established high levels of domestic fuel security), and sugar prices are looking attractive. Moreover, world demand for ethanol as environmentally friendly fuel is on the rise. Brazil has failed to take advantage of this new environment.

⁸ See Chapter 3 of Volume II for full details.

3.6 Let's look at the value of ethanol relative to the cost of the gasoline it displaces. The imported price of refined oil is \$25-29 a barrel. Ethanol, adjusted for its lesser efficiency, is around \$40 a barrel, making it about 40 percent more costly than gasoline. Thus, the net contribution of ethanol to the Brazilian economy is highly negative.

3.7 Ethanol has other qualities which make its potential economic value greater than as a fuel substitute, including a torque advantage, which may compensate for its lesser efficiency and could mean that a smaller ethanol engine could replace a gasoline engine. There is also an exhaust emission advantage—that is—less carbon monoxide, hydrocarbons, nitrogen oxides and no lead emissions. Moreover, unlike fossil fuels which pump carbon dioxide into the atmosphere, ethanol only cycles it. Anhydrous ethanol can also be used as an octane enhancer and contains about twice as much oxygen by weight as other competing oxygenates such as ether and MBTE.

3.8 So, what are the results of Brazil's sugar/ethanol policy? Quantitative controls on exports mean producers do not have incentives to develop ethanol export markets. Creative marketing by competing private firms is stifled because domestic distribution and marketing is controlled by a state monopoly. And supplies for exports are unreliable, due to the quota system and the need to first satisfy domestic demand. Indeed, Brazil will have little idea of the value of its ethanol until it uses international markets to test its worth.

3.9 Despite Brazil's efficient production of sugarcane and sugar, cost-of-production pricing for ethanol and sugar insulates producers from competitive forces which would compel them to seek even lower costs. Moreover, quotas on production and restrictions on building new facilities reduce incentives for new entrants for takeovers and for adopting international best practice. On top of that, Brazil has invested many resources in developing ethanol engine technology for a small domestic market (rather than borrowing technology) which has added to the costs of its car industry.

Getting Policy Right

3.10 The objectives of government should be clear—to maximize the income from production and sales of sugarcane based products and to ensure, as part of an integrated (but independent) environmental policy, the environmentally friendly qualities of ethanol can be fully exploited, domestically and internationally. The emphasis should be on developing a sugarcane sector policy, which would be responsive to whatever environmental policy Brazil pursues.

3.11 The challenge is how to allow unfettered markets for sugar and ethanol to function efficiently. This will mean removing all production quotas and allowing the unhindered private marketing of ethanol domestically

and internationally. Both of these changes would make the fixing of prices redundant and leave private producers free to determine the proportions of sugar, ethanol and by-products they wish to produce and market. Domestic and export taxes could continue but only for raising revenue.

3.12 Regional subsidies (that is, sales tax exemptions to producers in the Northeast) should be abolished. Freeing up the market and shifting to world prices would probably raise producer prices, even in the North/Northeast. So higher world prices might more than compensate for the loss of tax privileges. Should the government wish to continue support to the Northeast, there should be neutral transfers, which do not interfere with producers' incentives.

3.13 In the past, Brazil has concealed its competitiveness in sugarcane based industries. With production controls, it has sent a message to the rest of the world that it is not prepared to supply more sugar at world prices. Other countries have adopted policies to encourage cane growers, who are (invariably) less efficient than the Brazilians. Thus, the most influential initiative that the Brazilian sugarcane based industries could take to reduce protectionism elsewhere would be to let others know how willing (and capable) it is of producing more sugar and ethanol at competitive prices. The potential Brazil possesses to release large amounts of sugar onto the world market would reduce world price and price variability. This action would raise the cost of protection in other countries.

3.14 The Brazilian government and the industry should sponsor and promote studies on sugar and ethanol trade which reveal the wholesale corruption of these markets. The studies could be used as a basis for negotiations on other countries' restrictive policies and carbon emissions. Already, Brazil is a member of the Cairns group and plays an active role in GATT, making itself visible through the Uruguay Round.

3.15 The environmental benefits of ethanol are not being fully recognized in environmental policy. Brazil needs to quantify the health and environmental benefits of ethanol and develop an explicit policy to ensure it economically makes the most of those benefits. It should also seek international recognition for its contribution towards reducing greenhouse emissions.

What a Better Policy Means for Brazil and the World

- National income would increase by between \$660 million and \$2.5 billion a year (see paras. 3.66 to 3.71 in Volume II).
- Brazil would exploit its comparative advantage in producing sugar by expanding to its economic margin. This would increase its influence in the world market, which in turn would counteract some instability created by other less competitive and disruptive suppliers.

- **Brazil would discover the real value of its ethanol. There would be more incentives to minimize the costs of producing ethanol and to seek out buyers who valued ethanol, as a gasoline substitute. There might also be incentive to draw attention to ethanol trade restrictions around the world.**
- **Policy uncertainty would be reduced, giving the industry the incentive to focus on the needs of markets, rather than trying to second guess government.**
- **The world price of sugar would gravitate toward the current Brazilian price although it would settle somewhat above that domestic price. This would provide distinct benefits to Brazilian producers.**
- **The highly responsive nature of Brazil's cane supply means that its production will expand to a high world price, drawing down the world price toward the internal Brazilian price. However, the export demand elasticity of ethanol, if reasonably high, will moderate the decline. A strong link could form between world sugar prices and ethanol prices.**
- **Brazil would reduce ethanol production and increase (maybe double) sugar cane production and stand-alone distilleries would invest in sugar making capacity.**
- **Brazil's change in policies would impose big costs on many other world sugar producers—roughly \$3-10 billion annually. World sugar consumers and Brazilian producers (and its taxpayers) would be better off, and the world's sugar would be produced using fewer resources. This would put enormous pressure on countries with protectionist policies to modify them, in favor of Brazil.**

SUGAR/ETHANOL POLICY

ISSUES

1. Present sugar/ethanol policies impose an opportunity cost of \$660 million to \$2.5 billion a year by failing to exploit Brazil's comparative advantage in sugar production and forcing conversion of sugar into ethanol. Failure to respond to improving opportunities to export sugar has raised the social cost of the sugar/ethanol policy. Failure to recognize and promote export opportunities of ethanol as an environmentally-friendly octane-enhancer increases costs of the program.

2. The policy emphasis on quantitative controls in the sugar/ethanol industries remains fully intact. Restrictions on entry into the sugar industry remain. Sugar and ethanol prices are set without reference to world prices. Ethanol is not being used in Brazil as an environmentally-beneficial octane-enhancer of gasoline. Pricing is based on costs of ethanol production which limits efficiency gains in the industry.

RECOMMENDATIONS

Domestic prices for both sugar and ethanol should be based on world prices, and export taxes abolished. Brazil should attempt to capture higher export revenues by deregulating the sugar/ethanol industries and by promoting the use of ethanol as an octane-enhancer. Greater emphasis should be given in trade negotiations to the removal of trade barriers on both sugar and ethanol.

A modified sugar policy would have immediate benefits for sugar producers and consumers. All plant quotas on sugar and ethanol should be removed. Those parts of PETROBRAS dealing with the sugar industry should be privatized as the fuel distribution, import activities, and other subsidiaries are spun off. Cost-based pricing should be dropped, in favor of market-determined prices to maintain a dynamic and competitive industry.

4. PUBLIC FINANCE⁹

FISCAL ISSUES

4.1 Brazil's constitutional reforms of 1988, its macroeconomic crisis and its stabilization efforts have had a major impact on fiscal relationships between the Federal Government and its agencies and institutions, the states and municipalities and on the taxation of agriculture. Those developments have also had an effect on the fiscal capacity of each level of government. These changes, in turn, can be looked at from various perspectives, including their impact on agricultural growth, employment, rural development and natural resource management.

Agricultural Taxation and Incentives to Invest, Employ Labor, and Buy Land

4.2 Taxes and subsidies have played a major role in Brazil's agricultural growth. Until recently, commercial policies imposed high implicit taxes on the sector; today, it is lightly taxed. Major distortions in favor of capital were provided by the income tax code and through massive credit subsidies to compensate for indirect taxation. Tax distortions and subsidies increased investment in big farms and assisted in the substitution of capital for labor. Labor-intensive, small-scale farmers were put at a disadvantage, as the distortions are capitalized into the price of land. Therefore, land prices exceeded the capitalized value of farm profits or land rents. Because small farmers are too poor to benefit from income tax exemptions and do not have access to subsidized credit, they cannot pay for land purchases from agricultural profits. Therefore, high land prices undermined their competitiveness relative to large farms. Such policies have thereby reduced agricultural employment and self-employment, and accelerated rural-urban migration. The anti-employment bias has received a further boost by the recent change of the rural social security tax from an output base to a payroll tax.

4.3 **Income Tax.** In 1990, tax changes raised the income tax of rural corporations from 6 percent to 25 percent, only 10 percent below that for nonagricultural businesses. Also scrapped were rules allowing individuals and corporations to deduct multiples of expenditures on modern inputs and investments against revenues which eliminated virtually all income tax liability. But new exemptions were introduced to defeat the purpose of the tax reform. Now total "rural" investment expenditures can be deducted from incomes in any current year, unlike the rules for other sectors¹⁰. Moreover,

⁹ See Chapter 4 of Volume II for full details.

¹⁰ Losses from agriculture can also be carried forward to successive years, a provision which is only being proposed for the nonagricultural sector.

"rural" enterprises can now average income (and, so, spread taxes) over 10 years by depositing sales receipts into special bank accounts which banks must use for agricultural lending. With these provisions, the Ministry of Finance expects income tax receipts from "rural" activities to remain close to zero for the foreseeable future.

4.4 Land Tax (ITR). In the past forty years, taxation of agricultural land has declined in most of the developing world, despite the merits of land taxation. Indeed, in Brazil, 1992 revenues from the progressive ITR (or land tax) were only 0.5 percent of GDP. This has been due partly to the unwillingness of farmers to pay the taxes, half of which were accruing to the federal government. Willingness to pay and cooperation in administration can be improved, however, by tying the provision of local public goods and services to a local tax. Benefits from taxation are then visible. The Federal Government should, therefore, transfer its 50 percent share of land-tax revenue to municipalities, compensating the (minor) loss in revenue by widening the income-tax base or by reducing the Municipal Participation Fund. Tax administration could also be simplified by formally eliminating the progressivity which, in practice, is circumvented by exemptions.

4.5 Sales and Value Added Taxes. The Federal Government levies an industrial products tax (IPI), municipalities levy a tax on services (ISI) and states impose a value added tax (the ICMS), of which 25 percent goes to municipalities. Brazil is the only country with a subnational value added tax.

4.6 The ICMS discriminates against exports of raw agricultural products because on these, the tax is not refundable. Nor is it for semi-processed agricultural commodities, where the content of agricultural raw materials is more than 60 percent of the value of the commodity. The rationale is to protect agricultural processing industries.

4.7 The ICMS is levied at the point of production. For poorer agricultural states, this tax on raw agricultural products provides a large portion of their revenues. These states tend to levy ICMS on agricultural products at rates higher than richer, urbanized states. Such bias, however, distorts the location of agricultural production towards those richer, urbanized states.

4.8 Social Security and Payroll Taxes. In its social security, Brazil is unusual among developing countries. It has extended benefits to all rural workers (employees, self-employed farmers and unpaid family workers), regardless of whether they were employed under formal contracts or as casual labor. In fact, social security is perhaps the only federal expenditure which provides big benefits to the rural poor.

4.9 While the benefits to the rural poor are impressive, Brazilian social security is an actuary's nightmare. For every Cr\$1 of rural contribution in 1989, Cr\$3.6 were needed for rural benefits. In urban areas, the ratio was 0.6, a big implicit subsidy of rural social security by the urban

one. While some difference between contributions and benefits might be expected, the differences in these ratios seem excessive.

4.10 In July 1991, the financing of social security in rural areas was changed radically. Farm firms which previously had contributed 2.5 percent of production value, now face a payroll tax of 28 percent (of which 20 percent goes to social security). The employee (who paid nothing before) must now meet a payroll tax of 8-10 percent. The self-employed, who likewise used to contribute nothing pays 10-20 percent of earnings. Such changes increased significantly the burden for labor-intensive agriculture and decreased that for capital-intensive activities (Table 4.1, Volume II). This raises questions of equity. For instance, taxes paid by coffee farmers in 1992 rose by 1140 percent and for sugar cane producers by 830 percent. By contrast, taxes fell by 60 percent for mechanized corn producers and by 97 percent for poultry farmers. Shifting from a production to a payroll tax raised real wages to the employer by 25 percent and creates incentives to use temporary workers and adopt non-monetary payment for workers. And the new system has already increased evasion. Indeed, it is estimated that 45 percent of the working population is evading the tax. As a result, the rural labor market is likely to become more informal. Indeed, the new social security tax laws are estimated to reduce formal employment by 17.4 percent and increase informal employment by roughly 3 percent.

4.11 Any changes in the financing of rural social security should accompany cost-cutting changes in the overall tax system, including eliminating generous retirement plans for privileged urban groups. Policymakers in rural taxation, however, should specifically consider financing social security out of:

- (a) either a single production tax (of, say, 3 percent) or one combined with a low payroll tax (of, maybe, 2 percent).
- (b) for family units, maintaining the current 3 percent production tax,¹¹
- (c) setting a uniform 10 percent payroll tax for self-employed rural workers (see paras. 4.21 to 4.23 of Volume II).

4.12 **Salário Educação.** This tax, which also discriminates against employment, is a federal payroll tax used to support primary education. Since benefits are not tied to contributions, it is not an appropriate way to finance education; the tax only aggravates the excessive labor taxation in Brazil. It should be scrapped and replaced by revenues from a broader income-tax base.

¹¹ A family unit is a family farm with no hired labor.

Government Spending on Agriculture, Natural Resources and Rural Development

4.13 What has happened to public expenditure in these sectors? In 1985-88, public spending on agriculture and natural resources averaged about 15 percent of total federal expenditure; in 1989-91, it was about 7 percent. This decline is welcome and reflects the Federal Government's determination to control spending on agriculture and natural resources. Agriculture is 10 percent of GDP.

4.14 The allocation of public spending also has changed. In 1985-89, expenditure on market interventions averaged 80 percent of all spending on agriculture and natural resources with public goods accounting for 13 percent, targeted programs for only 4 percent, and administration a modest 3 percent. In 1989-91, spending on market interventions was cut from an average of \$12 billion to \$5 billion (or 60 percent). Public goods accounted for 20 percent, targeted programs for 10 percent and administration 10 percent—a combined annual average of \$3 billion to \$4 billion.

4.15 Brazil has already made much progress in the difficult move from massive public intervention towards a more privatized, market-led agricultural economy. Many instruments of interventions have been eliminated, or slimmed. Further steps need to be taken, however. Subsidies need to be phased out, except for targeted programs to address acute poverty, food security or market failures, and realistic user fees introduced for most publicly provided services. Marketing and most agroservices should be privatized and public agencies closed or slimmed down. There is a need, too, to involve local communities in design and implementation of public expenditure in rural areas. Government needs to promote sustainable management of natural resources by strengthening public and rural community institutions that manage common-property resources, especially by providing appropriate incentives to those institutions. Much remains to be done if government is to achieve its avowed aims of growth, poverty reduction, and environmental sustainability. Government needs to address the size of federal spending on agriculture and natural resources and the allocation of expenditures within the sector. This is an opportunity to be seized now.

4.16 **An Operational Framework.** Public spending needs to support private-sector agriculture, rural poverty reduction and sustainable resource use. Specifically:

- (a) funding growth enhancing public goods, mainly in agricultural research, extension, public health, and rural infrastructure, and correcting environmental externalities associated with forestry, soil conservation, and integrated pest management; and

- (b) **poverty reduction through better rural primary education, health services and nutrition, and targeted agricultural development programs.**

4.17 In the past, the government of Brazil has defined "public goods" or "market failure" too loosely. As a result, public spending has risen unnecessarily. Often, spending has been justified on the grounds that farmers' demands were not being met by private suppliers and so the public sector should correct these "market failures". Such notions may have had public acceptance 20 years ago, but, today, government needs to ask whether publicly financed services are necessary and whether they have not crowded out potential private suppliers. Government financing of public goods and targeted interventions does not necessarily imply provision through public agencies.

4.18 **Market Interventions** can be subdivided into credit, pricing and marketing, and marketing boards. Despite recent declines, spending on pricing and marketing and marketing boards in 1991 was still \$1.2 billion; on credit it was \$3.4 billion.

4.19 Spending on marketing boards should cease. In food pricing, storage, marketing, grading and inspection, only "inspection" is a public good (that is, a public health function) but only for commodities where infections or impurities cannot be easily detected. The job could be contracted out to private firms. Beyond that, and targeted nutrition programs, all other spending in pricing and marketing should be eliminated.

4.20 On rural credit, the economic cost is huge with few beneficiaries. Drastic steps should be taken to rapidly phase out this program (see Rural Credit, p. 25).

4.21 **Public Goods** includes seven programs—crop production; animal production; extension; natural resources; research; agricultural education; and rural infrastructure. On these, annual spending averages \$1.9 billion.

4.22 There is no justification for government spending on crop production or animal production, save some aspects of crop and animal protection (migratory pests, contagious diseases, epidemics).

4.23 In extension services, public expenditure should be directed to crops (and problems) associated with small farmers. Other farmers should receive non-subsidized extension services, not necessarily supplied by the public sector.

4.24 Some of the increased spending in natural resources (from \$70 million in 1988 to about \$220 million a year since) went into expansion of the federal environmental protection agency and its programs, including land purchases for national parks and protected areas. Although agency field programs are inadequate (and there are managerial difficulties), government

spending here is a public good. Less defensible are poorly targeted subsidies for soil conservation and erosion protection. Subsidy advocates should be required to show evidence that techniques are socially (but not privately) profitable.

4.25 In research, spending has averaged \$570 million a year—or 1.4 percent of agricultural GDP, high for developing countries but low compared to, say, Australia. A case can be made for increasing public expenditure but, first, all means to increase the quality of spending must be explored (see pp. 39-60). Public spending on research, moreover, should be targeted to public goods—such as soil fertility management and integrated pest management rather than, say, chemical fertilizer and pesticide applications. Such targeting is important because it maximizes the effectiveness of public and private research spending and, generally, increases the relevance of public research to small farmers' concerns.

4.26 Spending on agricultural education is large and deserves scrutiny. This, however, should be approached from an education perspective, since it involves questions of the relative efficiency of spending on primary and other levels of education. Within the secondary and tertiary levels, it also involves questions of the relative efficiency of spending on vocational and other forms of education.

4.27 **Targeted Poverty Programs** can be subdivided into land reform and colonization, and regional development programs. Total spending rose from \$700 million a year in 1985-88 to \$1.1 billion a year in 1989-91. Spending on both land reform and colonization, and rural water supply and health (from a very low base), increased by about \$200 million. Spending on regional development was unchanged.

4.28 Land reform programs are extraordinarily difficult to administer, and this program fell victim to those difficulties. Brazil's massive land reform spending in 1991 has not been maintained because of (reported) scandal and abuse. Rather than government-administered land reform, a better approach would be market-assisted reform. Beneficiaries would be provided with a partial grant to assist them to buy land.

4.29 The major regional development program is SUDENE which costs about \$150 million a year and is targeted to poor areas, and to poor people, which hardly seems controversial. But it is, mainly because of the disappointing results in alleviating poverty. Clearly, ways must be sought to improve the effectiveness of this spending. Matching grants have proven to be an effective mechanism in many countries (see Targeted Programs, p. 36).

4.30 **Administration.** Total spending on administration increased from \$410 million in 1985-88 to \$940 million in 1989-91—a rise from 2.7 percent to 6 percent of all public spending. Of this increase of \$540 million, \$410 million was for debt repayment. So the "real" increase was \$130 million. If administration costs could be cut back to

2.7 percent of total spending, the savings would be \$300 million a year—or twice the spending on regional development.

Assignment of Responsibilities, Taxes and Revenues

4.31 **What has been the impact of the 1988 Constitution on fiscal relationships between federal, state and municipal governments?**

4.32 **Assignment of Responsibilities.** Although the constitution broadly assigned public service provision to federal, state and municipal authorities, some issues still need to be clarified and modified. Because of the wide dispersal of rural settlements, their heterogeneity, and the large area of municipalities in some states, further decentralization of some rural development functions to rural communities may be needed. Communities should, for instance, be given the authority (and the means) to plan, develop and manage local water supplies. Likewise, decentralization of some school management would lead to improvements. The same is true for management of agricultural extension. Again, a system of matching grants could be considered.

4.33 There could be more decentralization, too, in management of natural resources, national parks and biodiversity reserves. For example, IBAMA, which tries to run many reserves, could decentralize management to states, municipalities, the private sector and nongovernmental organization; it could continue to supervise and control quality through management contracts. Funding could be improved by increasing user charges, allowing parks and reserves to keep a big slice of the income.

4.34 **Tax Assignment and Revenue Sharing.** The revenue sharing system as reformed in 1988 does contribute to interregional equality but does not contain incentives for local revenue generation by states and municipalities. The 1988 reforms have greatly increased resources available to municipalities, which should help local governments to plan, coordinate and implement agricultural and rural development. However, expenditure and tax assignment, as well as revenue sharing, have constrained the Federal Government in its ability to fulfill its mandate as a national government because revenues fall short of expenditure. At the same time, the generous availability of funds to municipal governments (without any increase in responsibilities) has created incentives for fiscal mismanagement.

4.35 **Channelling federal revenue-sharing monies to municipalities is done through the Municipal Participation Fund (FPM), which takes into account municipal population and state per-capita income in determining shares. It has two major drawbacks. First, it fails to incorporate differential fiscal capacity of municipalities and, so, does not result in an equitable distribution of funds. Second, it discourages local fiscal effort by meeting nearly two-thirds of municipal revenue requirements. It would be better to reduce this program and make up the lost revenue by assigning the agricultural land tax entirely to the municipalities.**

4.36 Specific Purpose, Conditional, or Negotiated Transfers can be used to support public or quasi-public goods whose benefits spill over local (or state boundaries). Such goods include financing agricultural research and resource conservation; financing minimum standards of public services, such as primary education; and financing or cofinancing poverty-reducing development spending.

4.37 Brazil has many specific purpose (actually, unspecified or vague) programs. Many are poorly targeted to the provision of public goods, externalities or poverty reduction. The transfer mechanisms for many are convoluted and are subject to leakages and political influence. Finally, the Federal Government is heavily involved in program administration, so there is no decentralization of objectives.

4.38 The states also provide specific purpose or negotiated transfers to municipalities and most have many *convênios* to provide project assistance. Most are not explicitly linked to compensation for spill-over effects, conservation, sustainability or interpersonal equity. And so numerous are they (often thousands) that they defy systematic analysis. Many of the state and federal transfer programs will have to be redesigned if they are to be effective vehicles for implementing government policy. Matching grants mechanisms are not being used to meet clearly defined federal objectives on expenditure and policy. The exception is agricultural research. All federal transfers need to be examined and redesigned. For example, matching grants could be provided to states for establishing state parks or for administering federal parks within the state. Likewise, grants towards rural state-administered child health and nutrition programs could be undertaken.

PUBLIC FINANCE

ISSUES

RECOMMENDATIONS

Revenue Side

1. Now that implicit taxation via exchange rate and trade regime has been eliminated, the tax load of the agriculture sector is low.
Equalize fully the treatment of agriculture in the income tax code by eliminating all special "rural" rules.
2. Immediate write-off of fixed agricultural investment has defeated the intention of agricultural income-tax reform.
Adopt depreciation schedules that reflect internationally accepted standards for the various fixed investments.
3. Corporate tax rate of agricultural income is lower than for non-agricultural income, encouraging "verticalization". There is little basis for differential corporate tax rates.
Corporate tax rate on agriculture should be aligned with nonagricultural tax rate.
4. A special agricultural deposit scheme has been introduced which allows avoidance of income tax.
Eliminate the scheme.
5. ICMS still discriminate against exports and distort inter-regional allocation of production.
Ideally, change ICMS from an *origin* to a *destination* principle, thereby eliminating differential impact on production decisions. If administratively impossible, retain the origin tax with distribution of revenue on a destination basis. After achieving equal treatment of agricultural income in the income tax code, allow for drawback of ICMS of agricultural exports.
6. Collection of land taxes remains minimal because of insufficient willingness to pay, and progressivity of the tax rate is excessive. The progressivity is nullified by special exemptions for farms under crops or using modern technology.
Increase willingness to pay by assigning the entire land tax revenue to municipalities. Also, reduce the progressivity of the land tax rate, eliminate the exceptions for progressivity and leave only the homestead exemption.
7. Financing of primary education out of a payroll tax remains inappropriate because there is no link between payers and beneficiaries and this tax raises the cost of employment.
In general, earmarked taxes are undesirable and there are many in Brazil. Abolish the tax (*salario educacão*). Replace it with general revenues from by broadening the base of the income tax.
8. Shift of the agricultural social security tax from an output to a wage tax has made it virtually uncollectible and introduced a distortion against labor and labor-intensive crops.
Restore the original social security tax, via output tax or a surtax on ICMS.
9. The revenue sharing system maintains or improves inter-regional income equalization but reduces incentives for own-revenue generation of the states and municipalities.
Consider introducing a mechanism in the revenue sharing formula which rewards improvements in the fiscal efforts of states and municipalities.

Expenditure Side

10. Federal expenditures for rural areas contribute only marginally to interregional equity and poverty reduction. Spending is not well targeted to growth-enhancing public goods, nor to the reduction of environmental externalities.
The Government should link its remaining rural expenditures to activities that reduce rural poverty, enhance public goods and reduce environmental externalities. Spending and cost-sharing also need to be better targeted.

PUBLIC FINANCE (Continued)

ISSUES

11. Federal expenditures on agriculture and natural resources amount to over \$9 billion per year, of which almost half goes to agricultural market interventions (pricing and marketing, marketing boards, credit) and 15 percent to land reform. Less than 3 percent is allocated to environmental protection.
12. In general, federal transfers to states and municipalities are untied and do not require matching commitments.
13. State and municipal expenditures for health, education and water supply are also not targeted to the rural poor.
14. No transfer mechanisms for fiscal resources to small rural communities exist for productive investment or social services.
15. Convoluted and leaky transfer mechanisms continue to exist for educational finance.
16. Vague criteria for receiving health funds from FNS has politicized resource allocation.
17. Public sector regulations constrain the contracting to private sector, communities, and NGOs, of executing functions in conservation, agricultural development and delivery of social services
18. Rural road construction (non-frontier) and maintenance has declined, despite their contribution to agricultural growth.

RECOMMENDATIONS

- A major redirection of agricultural and natural resource expenditures should be considered, focusing government spending on public goods and market failures, and withdrawing spending from activities better suited to the private sector. Spending on market interventions should be greatly reduced. A market-assisted land reform program would be more cost-effective. More resources could be reallocated to environmental protection and research.
- The federal government is foregoing an opportunity to implement policy by not tying grants to specific activities. Local commitment to these policies would be further strengthened by requiring matching finance by the state or local government.
- Develop mechanisms that encourage states to better target their spending to the rural poor and the environment.
- Design a strategy to target federal and state funds to poor rural communities and municipalities for small-scale productive, infrastructural and social investments, in which local beneficiary organizations would be responsible for the selection, execution, operation and maintenance of projects. Criteria should include: transparent, participatory and representative decision-making, and built-in mechanisms for auditing, monitoring, evaluation, and cost recovery. Targeting should take into account both the poverty of the community and the poverty-reduction characteristics of projects. For complex projects, line-agencies should retain permit authority to assure the technical integrity of the projects.
- Reduce negotiated transfers unrelated to the aims of improving access to (and quality of) basic rural education.
- Federal matching grants should be used to direct state and municipal health expenditures towards the provision of rural primary health care, with an emphasis on maternal and child health and nutrition.
- The government should design its policy and regulations concerning "contracting out" of service and execution so that alternative organizations, including NGOs, can undertake these functions.
- The increase in land tax, resulting from its reform and reassignment to municipalities, should be used partly to finance road work. Targeting of state expenditures to poorer rural communities will help rectify the decline in road construction and maintenance.

5. AGRICULTURAL RESEARCH AND EXTENSION¹²

5.1 While EMBRAPA is the most important source of agricultural research in Brazil, not enough recognition has been given to the fact that EMBRAPA is only one part of Brazil's overall agricultural research system. A fully developed agricultural research system includes many other inter-linked players both public and private with a full range of capacity (from basic to adaptive research) including institutes, universities, firms, policymakers, and social groups. Nevertheless, the discussion here is focused on EMBRAPA and public sector agricultural research institutions in general, since they are so dominant.

5.2 By the mid-80s, Brazil's EMBRAPA was one of the strongest public agricultural research institutions in the developing world. Today, its capabilities are threatened by fiscal crisis. Agricultural extension has also been successful in some areas, primarily in Southeast Brazil. In recent years, however, it has suffered from the same lack of funding which has plagued all public enterprises in Brazil. In some areas, this has led to the near collapse of extension services. Thus, the most immediate problem is the severe budgetary constraints which face both research and extension:

5.3 **Budgetary Constraints.** Currently overall levels of public investment in agricultural research are inadequate. Sources other than the federal budget should be sought to supplement the traditional funding sources. Many public institutions can be partially underwritten by private sector beneficiaries of research. Often, EMBRAPA does not adequately bill private sector clients for services. EMBRAPA should find ways to obtain full-cost recovery for such research. It should also better market itself to the private sector. In public extension, at least partial cost recovery should be implemented.

5.4 EMBRAPA pays employees according to a standard government pay scale. Yet, this scale has been too low to compensate highly skilled workers for their opportunity costs in the private sector or abroad. To remain effective as a research institution, EMBRAPA should be free to offer competitive salaries, linked to the value of researchers' output.

5.5 **Prioritization of Public Research/Extension.** All activities to be included in EMBRAPA's research agenda should have to meet stringent criteria for public goods, externality reduction, and poverty reduction. Those that do not (or could be provided by the private sector) should be scrapped. This has been done for sugar, cocoa, coffee and rubber, but should be taken further.

¹² See Chapter 5 of Volume II for full details.

5.6 Agricultural research is a public good when the benefits of output cannot be fully captured by the research firm. In recent years, EMBRAPA research has emphasized noncommercial crops and farming systems. Increasing attention is being given to the issue of sustainability—an issue of social value but one on which it is hard for the private sector to capitalize. Increased resources are also being allocated to the development of integrated pest management, which also is not provided by the private sector. Despite this gradual shift in public research, commodity research continues. Therefore, all aspects of the program should be scrutinized to identify candidates for paring.

5.7 **Particular Needs of Poor Farmers.** Publicly financed research should be reoriented away from commercial crops. Modern commercial agriculture is managed by producers who are well educated and well off. These producers do not (and need not) rely on public extension services. Rather the system should respond to the needs of small farmers. Poor farmers rarely have the education or the means to seek out information from which they might profit. Not exclusively, of course, but public research does have a special responsibility to service those needs and its mix of activities should reflect that. All of this adds weight to the argument that commodity specific public programs should be carefully evaluated: are they truly public goods? It also suggests that extension services, at least those that involve field visits, should be offered exclusively to small and poor producers.

5.8 **Relevance of Agricultural Research/Extension.** There is inadequate communication between researchers and end-users and dissatisfaction with research priorities in both agriculture and forestry. The general perception among end-users is that EMBRAPA has talented people doing much research that is not geared towards solving real-world problems. Moreover, relevant research is not always rapidly transferred to the producer.

5.9 **Research and extension should be more "demand-responsive."** Producers should be consulted in setting research priorities. They should participate in the final decisions, even help determine broad thematic goals for research. Decentralized management of research and extension might help. More experiment stations should be transferred to the state or municipality, even to local universities. Field trials at on-farm locations can also be encouraged and expanded.

5.10 **Extension services, too, can be further decentralized to municipalities and local communities drawing on the experiences of other countries, such as Colombia, Mexico and Chile.** Public funds from federal and state governments could continue to support extension services but local people should be given responsibility for control and evaluation of such services. A matching funds feature and some cost recovery for services should be built into the system.

5.11 Linkages Between Institutions. There is a lack of linkage between institutions involved in research and extension. Joint appointments between institutions should be encouraged, not discouraged as now. Joint projects should be developed and matching-fund incentives should help accomplish this. Graduate students in agriculture and natural resources should be encouraged to do research in the public system, using the institution's qualified staff as advisors. And competitive grants for research should be made available from EMBRAPA. Each of these measures would help to establish natural links between institutions, making their activities more complementary and increasing productivity of all.

AGRICULTURAL RESEARCH AND EXTENSION

ISSUES

1. Both the public research and the public extension systems are depleted from years of budgetary crisis. Size and quality of staff are declining. Facilities are not being maintained. Investment in new facilities is non-existent. Day-to-day operational expenses cannot be covered.

RECOMMENDATIONS

These institutions should be made more autonomous so that salary restrictions could be lifted and other funding sources mobilized more fully. Strict criteria should be employed to prioritize publicly funded research, based on growth-enhancing public goods, environmental externalities and potential impact on poverty reduction. Research activities which can profitably be financed by the private sector should not be underwritten by the very limited public budget. For privately profitable research activities executed under contract by the public sector, full cost recovery should be sought. Extension services should be on a for-pay basis, even if part of the funding for these services is ultimately provided publicly (e.g., a voucher system). Criteria for partial or full public funding of extension can be based on the same criteria as research.

2. There is a lack of linkages between the institutions which provide research and extension services - EMBRAPA, universities, state level research and extension services, private sector.

Lift constraints to joint appointments in institutions involved in research and extension. Develop joint research and extension projects across institutions. Matching-fund incentives, linked to public goods, externalities, poverty reduction objectives, should be used to help accomplish this.

3. There is no mechanism to ensure that public research or public extension are demand-driven. Consequently, capable researchers and extension agents in the public sector are seen as irrelevant by the producers.

Decentralize the operational management of extension services to the municipal level and give producers greater roles in the control and evaluation of extension services. The process for setting research priorities should include representatives of the producers and other private sector participants. EMBRAPA and each of its research stations should have boards composed of stakeholders (including small farmers, consumers, cooperatives, and producer groups).

6. RURAL CREDIT¹³

6.1 Past agricultural credit policies in Brazil have been extremely costly, have contributed to concentration of land ownership and reduction of rural employment, and have failed to generate viable private rural financial institutions. While costs have been curtailed by raising interest rates to real (but below market) rates and by cutting the amount of credit allocated to agriculture, the other problems remain.

6.2 There are three main sources of formal rural credit:

- (a) credit at managed interest rates, where the interest-rate depends on farm size;
- (b) lending at market rates by banks and others; and
- (c) special funds and regional programs that target particular activities or producers.

The first is, by far, the biggest and is administered by financial institutions which are part of the *Sistema Nacional de Credito Rural* (SNCR).

6.3 In high-inflation countries like Brazil, borrowing costs and loan charges can exceed expected crop proceeds, since there is no institutional link between inflation and the price of raw materials and agricultural commodities. All but the largest producers (for whom it is easier to hedge price risks) usually refrain from borrowing. Self-financing, informal arrangements, or repayment in kind then become more common.

6.4 Many small producers, particularly the *minifundios*, find it difficult to get credit, unless they produce cash crops (in which case they can obtain pre-financing from buyers/exporters), or if they are in regions that benefit from targeted rural-credit programs. Few commercial lenders will accept the high risks involved in lending to small farms. For those, access to formal credit is limited to regional funds and SNCR lending. Subsidized credit, however, has become concentrated on commercial farmers who, presumably, have access to commercial credit. Of all SNCR lending in 1990, only 27 percent went to small farmers, 53 percent to medium-sized and large farms, and the balance to cooperatives (servicing mainly medium and large farms).

6.5 Total rural lending has declined dramatically from 1987 to end-1992. Official lending (over \$8 billion in 1988) accounts for the bulk of agricultural lending (78 percent in 1988); financed by the Federal Treasury and by special funds, it fell by two thirds. Private commercial lending,

¹³ See Chapter 6 of Volume II for full details.

which peaked at \$2.9 billion in 1988, had also dropped by two thirds at the end of 1992.¹⁴ Only 11 percent of rural credit goes to investment; most goes to finance operating expenses.

6.6 Nonbank credit at market rates (such as warehouse certificates for agricultural commodities) could lend more but for outdated laws and regulations. Change is needed. For example:

- There is an archaic and unwieldy warehousing system, governed by the *Lei de Armazenes* of 1972. It prohibits the use of negotiable commodity warrants that confer title to warehoused stocks. This is an obstacle to diversifying credit sources and makes it difficult to hedge price risk in the futures' market.
- The same law also establishes a state monopoly for the classification of commodities. That is a barrier to efficient trade in agricultural commodities because there is lack of trust in the integrity and qualifications of government inspectors.

6.7 The Ministry of Agriculture is revising the *Lei de Armazenes*. It plans to allow the issue of negotiable commodity warrants and wants to privatize quality classification of commodities. The World Bank can provide technical advice especially on how to tie reforms to risk management techniques.

Credit at Preferential Rates

6.8 Most subsidized lending is done through the *taxa referencial* (TR) program. It is regulated by the Central Bank and all lending is now at positive real rates. In recent years loans from these programs have been concentrated on fewer and fewer large producers, agroindustries, and cooperatives. The rate depends on farm income and there are three levels:

- 6 percent real for *minifundios* with gross yearly income of up to \$6,000 equivalent (at end-February 1993 exchange rates);
- 9 percent real for small farms and producer cooperatives, with gross income of \$6,000-\$18,000 equivalent;
- 12.5 percent real for medium and large farms and producer cooperatives with more than \$18,000 equivalent in gross income. Seventy percent of lending falls under this heading.

¹⁴ Data supplied by the Ministry of Finance, based on Central Bank sources.

6.9 All commercial banks and credit institutions (including BNDES, Banco do Brasil, and regional development banks) must allocate some loans to rural credit at preferential rates. Most banks must allocate 25 percent of deposits in demand accounts to rural credit at the *taxa referencial* (TR).¹⁵ Banco do Brasil, Banco da Amazonia, and Banco do Nordeste must allocate 65 percent of their lending to rural credit at 12.5 percent for up to 3 years. Banco do Brasil, the country's biggest bank, represented 73 percent of all rural credit in 1992.

6.10 The present state of the domestic economy complicates the phasing out of interest rate subsidies. An integrated approach, which overhauls the tax system, is needed in tandem with the phasing out of subsidies. The majority of subsidized credit goes to medium and large commercial farmers. This is an inequitable and unnecessary transfer of wealth to the non-needy and should be phased out. Equally, though, arranging loans to small farmers may be costly for banks. Therefore, it might be better to subsidize these transaction costs over a period until a relationship is built between private commercial banks and small farmers. Such schemes are being developed in other Latin American countries (Mexico, Bolivia, Nicaragua) and could be considered in Brazil.

6.11 There is other directed lending at subsidized rates but the volume is small compared to the TR program. Many are hard to justify. They distort credit markets, help crowd out the private sector, inhibit the development of alternative credit instruments, are costly to administer and have little effect on agricultural output or productivity. They should be phased out. One, the FINAME program, run by BNDES, provides subsidized investment credit. In agriculture, it is used to finance farm machinery purchases. It benefits only medium and large producers who are purchasers of farm equipment.

Non-Bank Rural Credit at Market Rates

6.12 Other source of lending to agriculture include:

- **Informal or "spontaneous" credit**, usually pre-financing by buyers/exporters of cash crops and derivatives, such as orange juice, coffee, wheat, maize, and soybeans; and
- **Rural credit cooperatives** which offer limited banking services (no checking accounts) and high transaction costs.

6.13 Borrowing from these sources is at prevailing market interest rates. At end February 1993, these averaged around 30 percent a year *in real terms*.

¹⁵ At present that obligation is somewhat academic because only few people or enterprises are willing to keep funds in demand accounts when inflation averages over 25 percent per month.

Special Regional Programs and Funds

6.14 Constitutional Funds for regional financing are financed with a 3 percent levy on government revenue from income, profit and industrial product taxes. There are three such funds:

- The Fund for the Center-Western region, managed by Banco do Brasil.
- The Northeastern Fund (FNE), run by Banco do Nordeste do Brasil (BNB).
- The Fund for the Northern region managed by BASA.

6.15 All lending must be at a maximum of TRD plus a spread of 8 percent. Lending is for farmers, industry and agro-industrial producers and must help promote economic and social development. Priority must be given to small rural producers, micro and small private enterprises, associations and cooperatives. Loans have maturities of 8-12 years, with 2-4 year grace periods. In 1991, the FNE loaned US\$700 million to almost 30,000 private producers and enterprises, roughly a third of which were in farming. All but 5 percent of borrowers were micro and small enterprises/farmers.

6.16 Directed credit is an inefficient mechanism to transfer wealth. If the purpose of the constitutional funds is for regional and/or rural development. Matching grants, whose features are described in the Chapter 7, would then be appropriate. The goal of any directed credit program should be to establish viable commercial relations between private lenders and small entrepreneurs. A transactions cost subsidy, mentioned earlier, meets this goal.

RURAL CREDIT

ISSUES

1. Agreement has been reached in principle on removing subsidized credit for agriculture but there is no strategy nor political commitment. Working capital under the program is mainly going to a few large farmers and agro-processors. The present credit program contributes to the maldistribution of farm income and is unnecessary as farm financing is being found through alternative channels by the large majority of farmers.
2. Credit for capital equipment provided under FINAME is now available to the agricultural sector thereby making agriculture more capital intensive and further biasing agriculture against labor. While agriculture is now treated identically to industry for investment credit, both are receiving subsidized credit.
3. There is no institutional framework to support savings mobilization from (and credit availability for) small producers, such as credit unions, cooperatives, and small producers and entrepreneurs in rural areas.

RECOMMENDATIONS

- The current agricultural credit program should be replaced by a scheme to underwrite the transaction costs of credit provided by private commercial banks to small farmers.
- There is little economic justification for the preferential interest rate under FINAME. It should be progressively raised to at least the government's opportunity cost of funds - and then phased out.
- Re-examine the regulatory framework and modify it to allow for the development of private rural financial intermediaries. Develop a program to encourage the development of private financial intermediation for small farmers and small rural entrepreneurs.

7. LAND MARKETS AND LAND OWNERSHIP¹⁶

7.1 Brazil has a highly skewed distribution of farm land compared to other countries—and even compared to other South American countries.¹⁷ The result is a highly dualistic agriculture, where farms are either medium-to-large commercial operations or small semi-subsistence farms. Such a distribution is inefficient and capital intensive, thereby not only producing lower output for a given level of inputs but also reducing employment and self-employment in agriculture.¹⁸ The maldistribution of farm-land ownership in Brazil has its origin in administrative procedures to allocate land, perverse tenancy legislation, macroeconomic instability, distorted tax and credit policies, and biases in the provision of public services to agricultural producers. What changes are taking place that address this mismanagement?

Policy Update

7.2 In Brazil's land markets, there have been few major policy changes since the Bank's 1990 Agricultural Sector Review. Those that have are:

- (a) The collection of agricultural land taxes has shifted from INCRA to the Federal Revenue Department (*Receita Federal*).
- (b) INCRA's land discrimination, regularization and titling has virtually stopped since 1988.
- (c) The Brazilian Congress continues to debate land reform articles (184 & 185) of the 1988 Constitution.
- (d) Tax-revenue sharing (between the federal and state governments), under the 1988 Constitution has resulted in big cuts in funds to INCRA.
- (e) Of greater impact on land markets and tenure have been sectoral and macroeconomic policy changes, including the sharp reduction in agricultural credit subsidies, high inflation, and the gradual enforcement of the labor laws for agricultural workers.

¹⁶ See Chapter 7 of Volume II for full details.

¹⁷ See Table B.9, Chapter 6, Volume II

¹⁸ See Kutcher and Scandizzo, and Binswanger et al 1993.

7.3 Distribution of (and access to) land in Brazil continues to be skewed, despite attempts at land reform and allocation. This is both inequitable and inefficient. Empirical evidence from Brazil and elsewhere show that small and medium family-based farms continue to be highly efficient and provide greater employment than large corporate farms. Constitutional provisions (Article 185) allow alienation or concession of unlimited public land to a prospective buyer but require effective use of the land. This stimulates ownership concentration and encourages the razing of native forests to "prove" effective use. This has adverse environmental effects in areas which should otherwise be preserved or subject to forest use and management. These legal provisions should be reviewed.

7.4 A continuing unsettled issue is the stock of public lands (registered plus potential) which may be redistributed through land reform and colonization projects, concession or sale, reserves, etc. Neither the Union nor the states really know their registered and potential stock of lands, although better information will be available when the results of INCRA's cadastre are released. On 1987 data, the Union had under its domain without formal designation (including "pure" vacant lands (*terras devolutas*), plus lands occupied by squatters without recognized rights) some 57 million hectares, almost entirely in the North. There was another 4 million hectares, expropriated for redistribution, in the North, Center-West and parts of the Northeast. Discrimination efforts¹⁹ were halted in 1988. Therefore, there have been no substantial additions to stocks and the legalization of areas occupied by eligible squatters has stopped. The issue of *terras devolutas*, however, needs to be resolved before the pressure of illegal use of land removes options from the Government.

7.5 Renting and sharecropping are two typical forms of temporary access to land, the latter mainly for landless and small, poor landholders. Only 4.4 percent of total farm area is managed by renters and sharecroppers. The rental market and sharecropping arrangements mostly involve small plots of land of up to 10 hectares. From 1970 to 1985, there was a decrease in the average area under sharecropping, while the average area rented was virtually unchanged. By contrast, total area and average area occupied by landowners increased.

7.6 Legislation on renting and sharecropping sets ceilings on rents and crop shares, and provides nearly permanent rights to tenants after a few years. This has made tenancy and sharecropping unattractive to owners. The perverse effect is to reduce access to exactly those people who the rules

¹⁹ Discrimination is a legal process through which private land is separated from public lands. A parcel of land is considered private when the claimant can prove its legal detachment from the public domain. If such proof is not available, the parcel is considered public, regardless of whether it is occupied or not. Once a parcel of land is recognized as public, it is registered as Union or state property and subsequently a decision is made as to its destination (such as transfer to squatters if certain conditions are met; reserves; colonization project; concession or sale).

were designed to protect. In addition, the Land Statute provides that "expropriation.... will be applied to: ... areas with high incidence of renters, sharecroppers and squatters." The threat of expropriation may have been more powerful in reducing the rental market and sharecropping arrangements than any other provision. These provisions with clearly perverse effects should be eliminated.

7.7 Labor laws also have anti-sharecropping bias. Under informal or verbal sharecropping contracts (which are widespread), landlords will always risk having the sharecroppers claim rights granted by the labor legislation, which are often recognized by the Labor Courts as evidence of "occupation". While benefitting individual workers, the impact on agricultural employment and self-employment is perverse. Moreover, the change of social security tax from an output base to a payroll tax on agricultural workers has caused some landowners to reduce hired labor and accelerate the substitution of capital for labor.

7.8 Land prices influence the accessibility to land of the poorer rural population. With subsidized agricultural credit policies in the 1960s and 1970s, the credit subsidy was capitalized into the price of land. The use of land for collateral (and the possibility of diverting some credit to other more attractive investments) also increased the price of land. For equity investors, agricultural land was a profitable investment. The real returns to agricultural land during this period exceeded returns on most other financial assets. That made land less accessible to those who wanted to use it for agriculture.

7.9 High inflation and unstable monetary and price policies increased the demand for agricultural land by equity investors. And because of continued high inflation in the 1980s and the 1990s, agricultural land is still a safe hedge. The freezing of financial assets at the beginning of the Collor administration merely showed again the risks in holding financial assets compared to land.

7.10 Income tax laws continue to provide distortionary incentives for nonagricultural investments in agricultural land (see Chapter 4). Only 0.6 percent of income taxes comes from the agricultural sector (which accounts for about 10 percent of national income). Agricultural land remains a tax haven for wealthy investors, which increases its price and reduces access for those who cannot take advantage of tax laws (small farmers and landless workers).

7.11 In short, the rural poor (as tenants, sharecroppers, or buyers) are at tremendous disadvantage in land markets. The dualistic structure of farm size is a consequence not of inefficient small farmers but of the distortions they face.²⁰

7.12 Is land reform still a valid approach in Brazil? The bureaucratic approach to land reform and settlement, with its long delays, high costs, and possibility for abuse, has hurt the reputation of the program. However, small-scale farming and employment-intensive agriculture are still desirable goals based on efficiency. Therefore, new approaches using land markets are needed to open more opportunities for small-scale and employment-intensive farming, through owner-operated farms or through renting and sharecropping.

7.13 One possibility is tenant group purchases of larger tracts of land to establish small- and medium-size farms. The provision of grants to recognized groups (for example, rural community groups) for the initial down-payment on land would substitute for credit and lower administrative costs. Since large parcels generally sell for less per hectare than small ones, small-farmer groups could lower per unit costs of the land they acquire. Vouchers could be used to help the group obtain land surveys, titles and other services. Once the land had been divided, individual operation may be preferred. If so, individual owners would be responsible for paying the remaining share of the land costs. Another alternative might be an association between government and private landowners/entrepreneurs to ease access to land for prospective small (poor) buyers, exchanged for infrastructure (roads, electricity) that enhances the value of the land. Some attempts have been made along this line, and their results should be evaluated. Moreover, there may be political support for such programs among those opposed to expropriative land reform (land owners and fiscal conservatives) and representatives of the rural poor. Rural NGOs may also see it as a way to mobilize support for their programs. Further development of the idea and a pilot project seem warranted.

7.14 In the long run, the solution to access to land will depend upon a stable economy and the removal of market distortions. Early "cleaning" should focus on: (i) perverse legal constraints to rental and sharecropping arrangements; (ii) anti-labor legislation; and (iii) subsidized credit, fiscal incentives, and tax policies which create advantages for large landholders. In the absence of such reforms, poor and potentially efficient smallholders will continue to be denied access to land. Land redistribution will be defeated by existing distortions.

²⁰ The pervasive social and economic dualism in Brazilian society is seen in the lack of formal education, unfamiliarity with bureaucracy, limited access to information, subservience, and other behavior of the poor. The impact of the "culture of poverty" is hard to measure, but it is a factor that limits access to land and

LAND MARKETS AND LAND OWNERSHIP

ISSUES

1. Loopholes in the income tax code exempting agricultural income from income tax are capitalised into land values, thereby decreasing the accessibility of land to the poor.
2. Land allocation and titling rules still encourage deforestation.
3. The fiscal and administrative capacity of the government to distribute land to the rural poor has diminished. The administrative procedures where government first buys land and then distributes it to beneficiaries are excessively time-consuming and costly.
4. Remaining public land suitable for agriculture is not allocated explicitly to small farmers, due in part to past controversies surrounding settlements in Rondonia.
5. Without removing existing distortions against small farmers in land, labor, credit and tax policies, land rental and sales markets will not redistribute land toward smaller, efficient farms.

RECOMMENDATIONS

Close all loopholes in the income tax code.

Remove the remaining rules so that incentives to clear land as a way of demonstrating possession are eliminated.

Providing adequate fiscal resources are available, the government needs to redesign the land reform program to a market-assisted one, where poor private communities are assisted in buying land directly from private sellers. Worldwide experience with such schemes could be tailored to the needs of Brazil. The government would finance a part of the cost of land purchase and technical assistance.

The government needs to reexamine opportunities to allocate remaining public lands with clear agricultural potential to smallholder settlement, using simplified administrative procedures relying more strongly on community self-management.

These distortions against smallholder agriculture need to be removed as a precursor to any meaningful redistribution of land.

8. SMALL FARM AGRICULTURE, RURAL DEVELOPMENT AND SOCIAL SERVICES FOR THE RURAL POOR²¹

8.1 As a result of legislation and regulations, agriculture in Brazil is unusually capital-intensive. Farms tend to be either medium/large commercial operations or semi-subsistence farms. There are relatively few small-to-medium owner-operator farms—the most efficient form of farming.²² The growth in agricultural output over the last two decades has been approximately five times that of the growth of employment in agriculture. Thus employment and self-employment opportunities in agriculture are lost. Here are some of the legislative and policy biases against small farmers and rural workers:

- The FINAME subsidized credit program for tractors and farm equipment encourages large-scale mechanized agriculture.
- Lines of subsidized credit for working capital under SNCR go almost exclusively to large farmers because they are creditworthy.
- Income tax exemptions for agriculture have encouraged land holding as a tax haven. The value of this use has been capitalized into the price of land so that land prices exceed the capitalized value of farm profits, making land inaccessible to potential smallholders.
- Rapid inflation has encouraged landholding as a safe store of wealth. The value of this use has also been capitalized into land prices.
- The social security tax in agriculture and other labor taxes are so large that they encourage the substitution of capital for labor.

²¹ See Chapter 8 of Volume II for full details.

²² Among 117 countries, 13 of the top 14 in terms of total factor productivity are countries where small-to-medium owner-operator farming is dominant. The exception is North Korea which has a collective system. (Prosterman and Riedinger, 1987). For a complete survey of literature on the relationship between farm size and productivity, see Binswanger et al., 1993.

- Legislation to protect farm workers who are resident on large farms give them claims to the land— and give owners strong incentives to not use resident labor.

8.2 Eliminating these biases against small farmers and rural workers will be a key to vigorous rural development. But further assistance for the sector may be required. What special programs exist for the small farm sector in Brazil? What rural development programs work? What social-infrastructure programs are in place? And what are the policy recommendations for a rural development strategy?

Small Farms and Rural Development

8.3 While rural poverty exists throughout Brazil, smallholders and rural poverty are concentrated in the Northeast. Small family farms produce mainly basic foodstuffs and small-scale animal husbandry because of the uncertain climate and market fluctuations. Price controls on food staples discourage large farm production of these commodities. Small farmers in the Northeast rely increasingly on a complex of activities for subsistence—traditional subsistence agriculture, cash crops, casual non-agricultural work, and remittances from family members living in cities. Of course, the rural poor comprise not only smallholders but also landless workers, sharecroppers and others.

8.4 There are a few special programs to assist small farmers. The Constitutional Financing Fund of the Northeast (FNE) and the Special Credit Program for the Agrarian Reform (PROCERA) are two. Both have mechanisms to ease difficulties in repaying inflation-indexed loans. For the FNE, a 15 percent set-aside in a savings account is sufficient for full repayment of the loan, and PROCERA allows repayment in kind. However, coverage is limited—for FNE to members of agricultural cooperatives and for PROCERA to agrarian reform beneficiaries.

8.5 In 1990, the government scrapped a rural development program with wide coverage (*Programa São Vicente*). It provided small grants to groups of small farmers and may have ended because the program stimulated grassroots leadership that threatened established political leaders. Many mayors and state governors opposed the program because they could not control the selection of beneficiary associations or the approval of individual projects. Beneficiaries, however, generally considered *São Vicente* a success.

8.6 The Program for Integrated Development of the Northeast (POLONORDESTE) was initiated in 1974 by the Bank. An evaluation in 1987 showed that its administration was complex, and planning and management top-heavy. It failed to develop appropriate technology for small farmers, who were reluctant to adopt anything that entailed higher costs and/or risks. A second generation of rural development projects initiated in

1985—the Program of Assistance to the Small Farmer (PAPP)—focused on areas with high agricultural potential and on a few priority components, including community participation for small-scale productive and infrastructural projects (or APCR).

8.7 The mid-term review of PAPP (1991) concluded that, in most states, APCR is a success even though most of the productive investments financed have led to only marginal improvements in income. Sustainability has not been assured, often due to lack of working capital. APCR, however, gave beneficiaries (and their nongovernmental organizations) a voice in planning and decision-making. Allowing for more community participation in rural development could increase the effectiveness of programs.

8.8 In rural development, some NGOs are geared towards eliciting the views of small farmers. They cooperate in identifying community development priorities and building local technical and administrative capacities. NGOs also help in community organization and incorporating women's and environmental issues into development projects. They bridge the gap between small farmers and funding agencies. There is ample scope to develop the technical capacities of Northeastern NGOs, whose role may have been limited by reluctance of funding agencies to cooperate with them. The Government should take advantage of NGOs' commitment to working with poor rural communities in spelling out economic and social needs, and to help ensure that "demand-driven development" is both informed and sustainable.

Social Services for the Rural Poor

8.9 Brazil's Northeast has higher infant mortality (75 per 1,000 live births) than some low-income countries (China, 29; Kenya, 67; Vietnam, 42) and its educational achievement is the lowest in Brazil. Despite the widespread social service infrastructure in rural areas, such as schools and health posts, there is a permanent lack of qualified personnel.

8.10 **Health.** Brazil's health system and the National Health Fund (FNS) rely almost exclusively on payroll taxes included in the Social Security Budget and thus compete with other social security-related expenditures for financing. The law specifies general criteria for the allocation of funds to states and municipalities but there is too much room for discretion and interference. Negotiated agreements (or *convenios*), as opposed to automatic and regular transfers, are still the main way of transferring health-related resources.

8.11 In 1990, Congress established the Unified Health System (SUS), which defines the services and actions of all public health services—national, state, and municipal. The Ministry of Health supervises the SUS and the National Health Conference establishes health policies. States deliver health

care under norms and policies specified by the Federal Government, and municipalities (individually or collectively) have the primary responsibility for delivery.

8.12 One successful example of decentralization and innovation in health is in the state of Ceará. Trained community health workers are deployed in the rural areas and each has a specified number of households to educate on (and monitor) basic health and sanitary practices. Some Northeast NGOs are also experimenting with community-based health programs, with emphasis on health issues of women and children.

8.13 **Education.** Federal financing of basic education comes from two main sources. First, there are tax revenues, principally the *Salario Educaçào*, a 2.5 percent education tax on private sector wages which is collected at the federal level and returned to its place of origin. Then, there is the FINSOCIAL, the social investment fund financed by 0.5 percent tax on the gross receipts of all businesses. Educational resource transfers from the Federal Government to the municipalities are done mainly through *convenios* for primary education. As with health, there is much room for discretion and interference. Due to weak technical capability in small municipalities, *convenio* transfers may be biased against the most needy municipalities. Moreover, there are essentially two parallel systems of public schools, making the rural primary education system in the Northeast complex and convoluted.²³

8.14 A new generation of Northeast educational projects (designed by the Ministry of Education and the World Bank) emphasizes financing and management of education and pays explicit attention to developing states' capacities for sustained investment in education quality after the project period. Changes in teacher hiring, salaries, and financing are envisaged. But although municipalities are included in the project, there is no specific educational strategy by the states for the rural sector.

8.15 One big innovation in Northeast Brazil is community schools, providing education for low-income students in the cities of Recife, Salvador and Fortaleza. They are supported financially and technically by national and international NGOs, churches and parents; some also receive support from the state and/or municipal governments. By establishing themselves outside the normal public educational system, these schools sidestep frequent teachers' strikes and lack of space in public facilities. They are also a source of employment for young adults who want to be certified teachers.

8.16 **Nutrition.** Food shortages and famine are a recurring problem in the Northeast. Attempts to establish various food and nutrition programs, some with World Bank financing, have been made. None have been

²³ Harbison and Hanushek; and Winkler.

successful.²⁴ They were doomed by inadequate funding, deficiencies in operational procedures, and interministerial rivalry. Thus, Brazil has no effective, systematic programs targeted to pregnant and lactating women and children under seven years of age. Lower infant and child mortality has come about because of improvements in health care practices and water supply—not better nutrition. A systematic targeted nutrition program needs to be developed, along with a health care system to deal with malnutrition.

Findings

8.17 Public funds for development should be made available through community grants targeted to poor, rural areas of Brazil. This could be achieved through cost-sharing with states and municipalities. The following principles can serve as guidelines for participatory funding mechanisms:

- (a) **Autonomy and Accountability.** The resource transfer mechanism should be designed to respect the autonomy of small rural communities. It should also stimulate their ability to identify community investment priorities, develop project proposals, administer funds, and operate and maintain the investments undertaken. This implies accountability at the local level.
- (b) **Cost sharing/Matching grants.** Simple formulae should be developed governing the communities' contributions to rural development initiatives. Recent experience in the APCR and *São Vicente* programs and in other countries suggest that if beneficiaries share in 10-30 percent of project costs (with flexibility regarding in-kind contributions of labor and/or materials), there is a positive effect on project sustainability. This mechanism ensures accountability and community "ownership." The federal government should target broad areas of social infrastructure by providing a generous matching grants program that include the principles outlined here.
- (c) **Sustainability.** Project sustainability is strongly linked to local ownership and to adequate operation and maintenance. Projects should be demand-driven and own resources from built-in cost recovery (user fees) should be available for the recurrent costs.
- (d) **Transparency.** The tendency to politicize the transfer of funds must be minimized by establishing clear, objective criteria, monitoring systems, and grievance procedures.
- (e) **Flexibility.** Given the diversity of rural households' economic activities, and the importance of basic infrastructure and social services to well-being and productivity, project eligibility should

²⁴ Samnaio and Cammino.

be as encompassing and diverse as possible. It should incorporate agricultural training, small rural industry, water supply, electrification, health services and basic education. This would allow beneficiary organizations to prioritize their needs and claim "ownership".

- (f) **Simplicity.** Because of low educational attainment of the rural poor in Brazil, and in the absence of a strong history of community participation in development initiatives, project proposal criteria, review, approval and disbursement procedures should be simple and transparent.
- (g) **Small disbursements.** The transfer of resources to small rural communities should be proportional to their ability to absorb and manage them.
- (h) **NGOs as facilitators.** NGOs are well equipped to provide outreach to beneficiary communities, to foster community projects, to assist in the design of community projects, and to furnish technical assistance. The decentralization of rural development funding down to the community level should facilitate NGO participation.
- (i) **Social Services.** Increasing the role of local organizations in the delivery and control of basic health and education services could increase the coverage (and quality) of rural health services and primary schooling.

A Vision for Farming and Rural Development

8.18 Restoring agricultural growth and ensuring rural development is a government priority. This report has identified many areas where policy changes would contribute to these objectives. It envisages an agricultural structure and policy regime quite different than that prevailing now. Brazil has a strong and vibrant farming sector. Its potential to develop further is enormous. Rates of growth experienced during the 1970's can be repeated; rural employment can be enhanced; and brisk and equitable rural development can be restored. The World Bank sees an agriculture emerging in the future that is driven by private enterprise, that offers opportunities for new entrants, and is regulated by a minimum and neutral set of government interventions.

8.19 To achieve this vision the government must be prepared to rethink its role in managing agriculture and rural development, and to rethink the way it carries out its functions. Agriculture in Brazil and in other countries with competitive agriculture, is a private activity. It requires little direct management or assistance from government. The ideal role of government in these cases is to withhold intervention of all types other than those that meet the strict criteria of public goods, market failures and

environmental protection. Rural development, on the other hand, is more a mix of private and public activities. The primary role of the government is to ensure that the regulations, legislation and expenditures are neutral for the rural sector. Its secondary role is to intervene with programs which have characteristics similar to those outlined here, whenever the criteria for intervention, mentioned above, are met. An example is providing greater access to land for small farmers by removing the policy distortions that encourage large-scale, capital-intensive farming. But this requires a fundamental change in the governments attitude toward and treatment of agriculture and rural development.

8.20 The government will need to reorient its expenditures within the sector and ensure that expenditures are well managed. Legislative biases against rural employment will need to be removed. Per capita expenditures on social sectors will need to be similar in rural and urban areas. And financial or regulatory interventions into commercial activities will need to be withdrawn. With such a neutral policy environment agriculture can quickly respond to market signals and rural development will follow.

SMALL FARM AGRICULTURE, RURAL DEVELOPMENT AND SOCIAL SERVICES FOR THE RURAL POOR

ISSUES

1. Land and labor laws, income tax, credit subsidies, and many regulations still reduce employment and self-employment opportunities in agriculture and total factor productivity. These negative effects on rural opportunities and rural development dwarf the positive efforts of all directed rural development programs.

2. The accessibility, coverage and quality of rural education is limited by: public financing mechanisms that discriminate against poor municipalities; low salaries and problematic hiring procedures for teachers; and the lack of a comprehensive strategy for rural education.

3. Public health and nutrition programs have not succeeded in targeting the rural poor and high-risk groups, due in part to discretionary financing mechanisms and in part to ineffective delivery.

4. Community initiatives continue to be constrained by highly paternalistic fiscal and implementation mechanisms.

RECOMMENDATIONS

Laws, regulations and incentives should be designed to be neutral with respect to input usage. For rural social security, payments should be based on output. The direct and indirect legal and regulatory biases against labor in the tenancy laws, the tax code, the labor legislation, and the credit subsidies should be eliminated.

The Federal Government, together with states and municipalities, should develop a strategy for rural education utilizing a matching grants program linked to monitorable and measurable improvements in the accessibility, coverage and quality of primary rural education. Based on the experience of the urban community schools movement, the potential role of parents' or other community-level associations and NGOs in the management of publicly-funded rural schools should be explored.

Federal financing of health and nutrition services should promote interregional equality and rely less on negotiated transfers. Ceara's positive experience with community-based health workers should be adapted in other states.

Resources transfer mechanisms should be designed to stimulate the ability of small communities to select, implement and administer a range of development projects, including productive investments, health and sanitation, education and infrastructure. Beneficiary contributions to such projects is essential. Cost recovery and operation and maintenance responsibility at the community level is also essential.

9. CONSERVATION, FORESTRY AND BIODIVERSITY²⁵

9.1 A number of policy actions already undertaken in agriculture, and many of the suggestions discussed in this report are helping or will help with the sustainable management of Brazil's forests and natural resources. Examples are:

- Reducing subsidized agricultural credit has helped curtail large-scale livestock ranching in the Amazon.
- Liberalizing trade in agricultural products has increased the profitability of farming in existing agricultural areas relative to fragile frontier areas.
- Lifting controls on sugar/ethanol, modifying land tenure regulations, modifying taxation on farm labor, and developing small farmer/banker relations would offer improved employment opportunities in existing farming areas and diminish the incentive to migrate to the frontiers.
- Developing stronger, targeted rural development, health and education programs would increase the attractiveness of existing rural communities relative to migration into environmentally fragile areas.

But even with these indirect actions that have a positive effect on the environment, there remain specific actions and instruments that need to be developed to manage Brazil's extensive natural resources. This chapter is concerned with those actions.

Conservation

9.2 Roughly 5 percent of Brazil has been set aside for conservation and three quarters of the land in protected areas is in the Amazon, the region with the greatest biological diversity. While the scientific and conservation community have called for even more protection in the Amazon, and international attention has singled out this important region, Brazil has other important underprotected areas. For example, the central *cerrado* region covers almost 25 percent of Brazil's territory, yet less than one percent of it has been set aside for conservation. Of the semi-arid *caatinga* of the Northeast, only 0.1 percent is zoned for conservation. In formulating its national biodiversity strategy, Brazil will want to take into account all major biomes.

²⁵ See Chapter 9 of Volume II for full details.

9.3 Brazil could already define investment priorities in each of the country's major biomes based on existing information on ecological values and degree of threat. These priorities would need to be refined continuously as additional scientific evidence accumulates. In each biome, critical areas could already be identified on public and private landholdings. Improved management of such areas on public land could begin immediately, while a strategy is developed to tap opportunities for conservation on private lands. A research agenda, feeding into the existing (but still limited) knowledge on plant and animal species (and their niches) in Brazil's ecosystems, would be a helpful complement.

9.4 **Management of Protected Areas.** Understaffed, underequipped, and underutilized for research: that sums up the situation of Brazil's protected areas. The government needs to either significantly increase the staff in protected areas and invest in training—or take a different approach to management. In a few areas, the government is in (experimental) partnerships with state governments, NGOs and local communities. While the government cannot delegate essential policing to others, there are many tasks that might be performed more efficiently and effectively by contracting to local groups. The government should consider training staff now working on direct administration of protected areas to help them take on more policy and supervision functions. Legal and administrative rigidities that obstruct the formation of such partnerships should also be identified, and ways to ease them should be explored.

9.5 **Untapped External Financial Resources.** Discontinuity of management, bureaucracy, and shrinking budgets have stopped IBAMA from taking advantage of available external financing. While many of IBAMA's problems are in-house, some stem from distortions and over-regulation in the public sector. These should be identified and addressed as part of wider public-sector reform. That program should also aim for more transparency in decision-making and strengthen public information and debate. If IBAMA is to work fruitfully in partnership with other government and nongovernment agencies, it must reevaluate its administrative structure and the skill and location of its staff. These may need to be changed to strengthen IBAMA's ability to implement national environmental policy by contracting and supervising third parties, and monitoring and evaluating program effectiveness and the degree to which states fulfill their environmental protection obligations.

9.6 **Land Purchase for Protected Areas.** The government's policy is to expropriate all land inside most types of protected areas. Yet, it often is unable to allocate enough resources to compensate people with claims. Today, nearly 20 percent of the land in national parks, biological reserves and national forests is still in private hands. Only six percent of the land in ecological stations, and two percent in extractive reserves, is held by private landowners. To acquire all this land would cost, maybe \$500 million.

Brazil must define when land purchase is necessary for nature conservation and develop a purchasing plan as part of an overall conservation strategy.

Production Forestry

9.7 Native and Plantation Forests. Because there are few negative externalities associated with tree harvesting on plantations, industrial tree plantations are more similar to crop production than to timber extraction from native forests. As with crop production, there is little economic justification for public-sector regulation. Rules and regulations intended for native forests may not be applicable to plantation forests, and this potential defect in the New Forest Code should be reexamined. If planted forests are exempted from regulations, provision should be made to control the conversion of native forests into plantations. If enforced, other regulations are adequate to control inappropriate conversion.

9.8 Ineffective Regulations. Virtually every aspect of Brazilian forestry (from planting trees, to cutting, transporting, processing and marketing) is subject to regulations which considerably limit the rights of the private sector. Ostensibly, this is to preserve the environmental benefits of Brazil's forests. In fact, such intervention is often ineffective and undermines the government's credibility, as regulations are poorly enforced. Often, the aims of the regulations are unclear, or try to serve two conflicting purposes—protection and production. Regulations that may be appropriate in one region may be inappropriate in another. Few forestry regulations are sufficiently targeted at specific externalities, such as preventing soil erosion or protecting habitats. Moreover, regulations are frequently in conflict with the economic incentives driving the private sector, which makes them difficult to enforce.

9.9 As a result, Brazil's environmental institutions are misallocating scarce budgetary resources, rather than strengthening capacity to implement key policies. Brazil must urgently clarify objectives, simplify the regulatory machinery, and reform and retarget complementary policy instruments. Institutions will need to rebuild credibility if they are to successfully guide forestry along socially desirable paths. For that, transparency and openness to public scrutiny will be critical. Finally, the government needs to determine how much money it wants to spend on conservation and then develop a strategy for maximizing the effectiveness of this expenditure. This could be done through enforceable regulations, partnerships with state and local governments and NGOs, and inducements for the private sector to meet social objectives.

9.10 Targeted Incentives for Reforestation. There are many regulations restricting deforestation. There are no policy instruments, however, for encouraging reforestation of areas where externalities are large (for example, steep slopes and along watercourses). Reforestation fees collected from users of forests could be used by government to stimulate replanting in high priority areas. A study is needed to identify the most cost-

effective instruments to encourage reforestation of steep slopes and along watercourses and to target revenue from reforestation fees could then be used to implement the new policy.

9.11 Alternative Forest Management Regimes. Among the array of protected areas provided for in Brazilian environmental legislation are national forests (where government manages timber extraction) and extractive reserves (where organized communities harvest non-timber forest products, with minimal government oversight). These types of protected areas are called "direct use conservation units." Currently there are 24 national forests (126,000 square kilometers or 2.5 percent of the Legal Amazon) and eight extractive Reserves (22,000 square kilometers or 0.5 percent of the Legal Amazon). The government should consider creating a new type of direct use conservation unit, analogous to the extractive reserve. In such areas, called "forest management areas", the government would grant private timber companies or organized communities long-term timber extraction rights, subject to some restrictions and government oversight. In this way, timber extractors would have more freedom to determine how best to exploit the area. That would help reduce government costs of managing reserves. Oversight costs could be further reduced by requiring extractors to obtain certification from one of the internationally recognized green certification programs. In any event, the government would continue to monitor these private-sector extractors. Again, a study should be conducted to define alternative management regimes tailored to specific objective and circumstances.

9.12 Pricing of Extracted Logs. Logs from sustainably managed areas cannot currently compete with the low price at which non-sustainably harvested logs can be put on the market. The price paid to timbermen, however, does not reflect either the negative externalities associated with non-sustainable harvest nor the positive externalities associated with sustainable harvests. In light of this market failure, the government should consider introducing producer price differential (favoring logs extracted from a sustainably managed area of national forest over logs taken from non-managed areas) would give timber extractors an incentive to employ sustainable management techniques. Currently, no such price differential exists in Brazil. Schemes to introduce a price differential, such as a severance tax, should be examined.

Amazon

9.13 Road Construction. In the Amazon, the external costs of deforestation can be huge due to loss of biodiversity, release of CO₂, and hydrological and soil damage. Given the ecological importance of the Amazon forests, many areas need to stay under public ownership to ensure that decisions affecting the environment are internalized by decision-makers. Regardless of the management regime in different areas, access to forests by squatters, colonists and ranchers must be controlled closely. Any new roads must be carefully sited to avoid open access to fragile or ecologically critical

lands. In fact, no new roads should be built in such areas, and the government should give high priority to enforcement mechanisms that minimize access to those areas. The Federal Government should also help states and *municípios* by providing matching grants for strengthening environmental planning and enforcement of forestry regulations.

9.14 Unallocated Land. Much land in the Amazon is still unallocated to either the public or private sector. An estimated 25 percent of the Amazon's 5 million square kilometers is government-owned (either as federal or state conservation units, indigenous areas, or military bases). Less precise is the figure for private control: it is at least 2.3 million square kilometers (46 percent) and may be 3 million square kilometers (60 percent). On these figures, 14.5-28.5 percent of the Amazon is still unallocated although some are occupied. Given the importance of the Amazon to Brazil (and to the global community), high priority should be given to identifying the location, soil quality and biological diversity of this unallocated land. Strategies to maximize compatibility between conservation, regulated extraction, and settlement need to be developed. An appropriate settlement policy that takes into account the full environmental impact of forest conversion must be developed for any land allocated to private development.

Indigenous Communities

9.15 Property Rights. Save for a few individuals, indigenous people benefit little (or not at all) from legal or illegal exploitation of natural resources. The government has recently spent millions of dollars repeatedly removing illegal miners from the Yanomami and other indigenous reserves and trying to quell deadly outbreaks of malaria and other infectious diseases brought by wildcat miners. IBAMA and the federal police are legally responsible for protecting federal land, including indigenous reserves. In practice they have generally left the National Indian Foundation (FUNAI) to its own devices. Yet indigenous people are near-powerless to defend the reserves. Brazil urgently needs to examine whether and how indigenous people could be given rights to exploit natural resources in indigenous reserves in a sensible and sustainable fashion. This would be difficult to implement because neither the indigenous groups nor FUNAI have the ability to manage resources in a market economy. In any event, such policies would also need to be integrated into national conservation strategies to protect biodiversity, watersheds, soils, and other environmental assets.

Conclusion

9.16 The above considerations should be viewed as initial guidelines for further examination. In-depth assessments of these proposals to assess the potential economic and environmental impacts and to provide operational details, are required. The World Bank, in conjunction with the government, will be undertaking such an assessment in the future.

CONSERVATION, FORESTRY AND BIODIVERSITY

ISSUES

RECOMMENDATIONS

Forestry

1. There are no objectively determined priorities based on ecological values and degree of threat for allocating limited budgetary resources to conserving different ecosystems.
2. Management of conservation units remains poor.
3. Available external financial resources for nature conservation are not being spent because of insufficient allocation (or erosion) of counterpart funds, management discontinuities and excessive administrative bureaucracy, primarily in IBAMA.
4. There is no domestic finance to buy land for conservation units.
5. Land in native forests is still subject to higher land tax than deforested land.
6. Cost recovery in national parks remains minimal.

The Government should convene independent panels of experts to define and assign tentative scores for the ecological value and degree of threat to different ecosystems. Government could then use these scores to determine priorities for allocation of federal expenditures to these ecosystems.

Develop procedures for contracting conservation NGOs, the private sector, states and *municipios* or community groups to carry out selected management functions in conservation units.

Commit adequate counterpart funds. Identify and eliminate excessive bureaucratic procedures. IBAMA's institutional structure and the skill mix and location of its staff need to be adapted to a new emphasis on policy formulation, contracting and supervision, and monitoring and evaluation.

Define when land purchase is necessary for nature conservation and allocate budgetary resources to purchase land in accordance with nature conservation priorities.

Land tax rates for forest should be the same as agricultural land. Forest land with known externalities, should have a low or zero tax.

User fees should be adjusted to appropriate levels; collection should be tightened; and incentives for these changes should be provided by allowing each park to retain a share of the receipts it collects.

Production Forestry

7. Forest legislation does not distinguish between native and plantation forests.
8. Several overreaching or unenforceable forestry regulations are in place (e.g. property specific cutting regulations). While well-intentioned, they are blunt instruments to control deforestation since they are not closely tied to ecological objectives.

Rules and regulations should clearly distinguish between, and treat differently, native and plantation forests.

These regulations are not enforceable. Controls should be directly tied to environmental aims. More specific instruments that recognize topography as the defining principle (slopes, soil type, water-courses) for regulation and incentive purposes should be developed, and the old regulations should be dropped when adequate enforcement capacity is in place.

CONSERVATION, FORESTRY AND BIODIVERSITY
(Continued)

ISSUES

RECOMMENDATIONS

9. There are no targeted incentives to encourage reforestation on slopes and along water-courses where externalities are large. Reforestation cesses collected from users of forests are not spent effectively by the Federal government.
10. There are currently no alternatives to direct forest management by the government on public lands.
11. There is no producer price differential to discriminate against logs extracted in an unsustainable manner.

Conduct a study to identify the most cost-effective instruments to encourage reforestation of slopes and along water-courses. Retarget revenue from reforestation cesses so they can effectively support targeted incentives.

Undertake a study to determine alternative management regimes for public lands tailored to specific objectives and circumstances.

Develop systems which introduce a price differential, to create incentives for environmentally sound management.

Amazon

12. Road construction of states and municipalities in the Amazon is only partially under control.
13. Assignment of *terra devoluta* to private use (including small-holder settlement), extractive reserves, indigenous communities, national forests, parks has not been completed.

Declare a moratorium on federal, state and municipal expenditure on road construction into areas zoned as not suitable for agricultural development. Develop enforcement mechanisms. Provide matching grants for strengthening environmental planning and enforcement at the state and municipal levels.

Define a process for assigning remaining *terra devoluta* to alternative uses within five years. If any areas are to be for private use, define a settlement policy that takes into account the full environmental impact of forest conversion.

Indigenous Communities

15. Property rights to forest, water and mineral resources in Indian reserves are still undefined, leaving access essentially open and unregulated.

Assign clear property right to indigenous communities and assist them in developing and enforcing management policies based on contracts.

10. SUSTAINABLE AGRICULTURE

10.1 For agriculture to be undertaken in perpetuity, attention must be given to the private incentives and public role in soil erosion, water utilization, and agrochemical use. How well are these concerns being addressed in Brazil?

A. Soil Erosion and Land Degradation

10.2 Soil erosion is now recognized as a symptom of defective land management. The most common form in Brazil is aquatic erosion, where rain fails to penetrate the soil where it falls. Penetration can be improved by management changes. Vegetative and mechanical barriers are necessary to cope with storms which exceed the soil's capacity to accept water (even with better management) but they are the last line of defense against erosion, not the first.

10.3 There are many management changes which can reduce surface sealing of soil or promote a more open soil structure. These include protecting the surface from direct impact of raindrops by live or dead plant material; stimulating biomass growth; applying chemicals such as liming; and cultivating practices, such as deep ripping of soils in advance of the rains. Frequently, these measures interact.

10.4 Such biomass-mediated approaches also offer the farmer early returns because they enhance production. For the farmer, the changes (more vigorous varieties, catch-cropping, direct drilling, additional fertilizers, and reduced pest damage) are simply good husbandry. While governments may still need to provide some incentive for construction of the vegetative or mechanical barriers to soil erosion, much of the cost of such soil conservation can be taken up by the farmers themselves. Put simply, it pays to do it. Conservation, then, becomes essential for raising efficiency. Without such soil conservation, the sustainability of much of Brazil's agriculture will remain in doubt.

Current Problems

10.5 Soil loss and degradation are a particular hazard on land under mechanized annual cropping. From the extreme south up into southern Amazonia and the northern *cerrados* of Bahia, management of much of the land failed to maintain the organic content of natural forest or grassland cleared by settlers.

10.6 In some areas, this led to widespread sheet erosion or gullying. Unprecedented floods in Santa Catarina and Paraná in the early 1980s focused public attention on the consequence of unchecked runoff of rainfall in

a deforested landscape. More widespread, but less spectacular, however, has been a gradual decline in fertility.

10.7 Land degradation, is not confined to annual cropping. Often, planted pastures have degenerated and exposed base soils to the rain. And possibly the most spectacular erosion comes with drainage from roads or built-over areas directed onto agricultural land instead of into soakage.

Current Solutions

10.8 Largely because of the potential for increased returns to the cultivator, biomass-mediated soil conservation is increasing in the commercial arable areas of southern Brazil. In the early 1970s, IAPAR and some private individuals began work on direct drilling and other improvements in arable land management. With *ad hoc* farmer experiments and more formal research, some 2 million hectares are now under direct drilling. Use of live or dead mulches, less pulverizing methods of land preparation, deep ripping, investments in liming, and crop intensification designed to protect the soil and maintain organic matter levels, are also being adopted. The Bank's series of Land Management Projects in the southern states is supporting this. Many of the technical solutions are location specific; that is, techniques must be adapted to local conditions. This has been done in the South and in the *cerrado* but more R & D needs to be done.

10.9 Recent systematic evaluation of the effects of new soil management techniques show that they improve yield responses from current fertilizer use and reduce tractor sizes and hours of use. These economies, plus yield gains, typically range from 5-25 percent, more than offsetting the extra costs of incorporating cover crops into the farming system, using more herbicides, or controlling some of the pests and diseases which also thrive in the crop cover.

Current Needs

10.10 These management principles can also be applied to pasture or perennial/forest crop land. The technique is privately profitable and only requires that farmers be aware of it. However, if there is to be full protection of the landscape, other approaches are needed for off-farm areas.

10.11 The need to protect whole landscapes was recognized by the government in the early 1980s, when it launched its *microbacias* (micro-catchments) approach to agricultural development. This recognizes that on-farm interventions in conservation are limited if the land directly above or below continues to be badly managed. There must be agreement by all the resource users to apply conservation techniques to the catchment. The *microbacias* approach has since been tested on a pilot scale by some southern states and has evolved further with Bank support in the Land Management Projects.

10.12 The major advantage of the *microbasias* approach is that, through soil conservation committees of land users starting at microcatchment level and stretching to the state level, it creates a framework for consensus-forming on future land management. The micro-catchment committee also identifies improvements necessary (but not financially attractive) to the individual land user - for example, planting of protection forestry, better disposal of runoff from rural roads. It then gets them collectively approved and financed. Under the Bank projects, soil conservation funds have been created under which shared productive items (pesticide disposal points) have been agreed in a similar way, and then partially financed by the government.

10.13 While the *microbasias* is not universally applicable, many of its features are. Thus, it could be extended to other states, whose research and extension could focus on adapting the technology. Finally, since much farm-level change implies intensification it will require new investments and greater expenditure on inputs. So, credit must be available.

Policy Implications

10.14 Effective soil conservation does not depend on a policy of government coercion or government funding. Much can be privately profitable. Policy should take account of the need to keep it so and to ensure ready access by the private sector to the cost-shared funds when improvements in land management have a public good.

10.15 Policy should continue to promote the broad application of improved land management practices on a whole-unit approach (microcatchment or catchment). Safe disposal of run-off from non-agricultural areas, particularly rural roads, should be incorporated and financed publicly. Community participation in the whole-unit approach is necessary for its success and should continue.

10.16 Government technical support services should adopt a generally facilitating role, both in improving technologies and in their interactions with land users in helping them to make and implement catchment plans. Government research and extension staff should closely cooperate with individual farmer innovators and private input suppliers so as to take full advantage of their knowledge of individual areas and production systems, and their inventiveness. Government technical services should also focus on private extension services and the agricultural supply industry, not just land users.

B. Water Utilization

10.17 Responsibility for Brazil's water resources is split among several Government agencies; their policies and activities are not coordinated. In 1978, a special committee was formed by the Ministers of Interior and of

Mines and Energy to coordinate the work of all these agencies. It was effective initially but, as more water disputes occurred, a more institutionalized solution was required. In 1983, a study was commissioned by the National Department for Water and Electrical Energy (DNAEE) to define the organizational and institutional procedures for the integrated planning and utilization of water resources. It recommended setting up a National Water Council, with representatives of all concerned ministries and executive agencies. No action was taken until 1988.

10.18 The new Brazilian Constitution of 1988 calls for a National Water Resource Management System (NWRMS), comprising national and regional management boards. The joint Bank/Government "Irrigation Subsector Review" of September 1990 addressed this matter by calling for the establishment of a "National Water Council" and a Technical Office which would later become the technical and executive arm of the Council. Nothing has happened. A parallel Presidential initiative has also been mothballed.

10.19 Meanwhile, the Secretariat for Irrigation (SIR) of the Ministry of Regional Integration, with support from the Bank, is still trying to establish a national cadaster of existing irrigation water rights. This is important to any NWRMS and the development of a water marketing system, which will help in the efficient and effective management and allocation of scarce water resources. Recently, SIR has shown renewed interest in assistance from the Bank to establish a technical office to prepare the technical and legal basis for regulation and adjudication of water use in Brazil. For now, though, the absence of a national system means that water is allocated in an administrative fashion and its value in alternative uses cannot be reflected through a market mechanism.

C. Agrochemicals

10.20 In Brazil, there is plenty of scope for improving crop protection as crop losses are considerable (roughly estimated at 25 percent). These losses could be reduced greatly by use of pesticides and integrated pest management (IPM). But it must be done safely and effectively. Application rates (and timing) must be correct. Lags between application and harvest must be observed, proper selection of pesticides to make maximum use of biological controls must be utilized, and correct disposal of empty containers and of equipment washings should be observed. Protective clothing, of course, should be worn.

10.21 Brazil's pesticide market is more than US\$1 billion a year (at the first distributor level), making it the world's fifth biggest. Brazil still allows registration of several pesticides (such as DDT and chlordane), which are no longer registered in OECD countries because they pose unacceptable health or environmental risks.

10.22 There are four problems with pesticide use in Brazil.

- (a) **Misuse and Mishandling of Pesticides.** Rate cutting (that is, lower doses than those recommended) is common, especially among the poorer, small-scale farmers. Using too much is not much of a problem. Pesticides are, however, often applied at the wrong time or too often, and farmers do not always use the best products for the job. Restricted pesticides are often used on crops for which they are not meant. There is a serious problem, too, of mishandling pesticides and failure to wear protective clothing. Look at a recent study of cocoa workers in the state of Bahia:
- Some 72 percent did not use gloves, 98 percent did not use aprons, most wore short-sleeved shirts, over 30 percent did not wear hats, 85 percent did not use masks. Goggles were never used.
 - Around 43 percent smoked during the application or use of pesticides.
 - Nearly 87 percent ate their meals at the workplace, including fruits from land being treated.
 - Workers normally returned immediately to work on the crop after application of pesticides.
 - 60 percent of the workers were illiterate.
- (b) **Pesticide Poisonings.** With 26 Poison Control Centers in Brazil, many pesticide poisonings are documented. But it is difficult to draw firm conclusions as data is incomplete and do not distinguish between serious and insignificant incidents. Parana is a big agricultural state and one with much concern over the health and environmental impacts of pesticides. There, serious poisoning incidents still run at hundreds a year, and deaths at several dozen. Livestock are also poisoned (sometimes fatally) by pesticide misuse or abuse. More importantly, it is common for children to be employed as equipment operators in the Northeast. Children are less likely to wear protective equipment (headgear, masks and filters are not made in child sizes). They are also less aware of the long-term dangers of exposure and are much more susceptible to pesticide poisoning.
- (c) **Environmental Hazards.** Aerial application of pesticides is common, controls minimal. There are no attempts to avoid watercourses or to minimize drift. Contamination also comes from washing out tanks and equipment and allowing the effluents to drain into watercourses. Some farmers actually wash

equipment in rivers. Again, a safety campaign with prosecution of flagrant violations is appropriate.

- (d) **Residues in Harvested Crops.** The scale of this (and its effect on public health) are not well documented. Various studies suggest that pesticide residues in produce regularly exceed acceptable levels. It is important that federal and state authorities rigorously enforce the law, impounding produce and imposing penalties. Also needed is a powerful campaign of farmer education in the safe and effective use of pesticides.

10.23 More Government support is needed for farmer education and training programs. These are seriously underfunded and the tendency is for the industry (usually individual companies) to provide funds. Properly funded and run, these programs will eventually reduce many of the problems of pesticide use. At the same time, such programs must move towards a more integrated approach to pest management, in which pesticides play their proper role.

SUSTAINABLE AGRICULTURE

ISSUES

RECOMMENDATIONS

- | | |
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| <p>1. Some southern states have implemented land management plans on a micro-basin basis and this appears to have been effective. But there has been no further improvement in attention to sustainable land management issues since the mid-1980s.</p> <p>2. Pesticide poisoning of equipment operators, and other farm workers, has not declined while monitoring and enforcement remain inadequate. Children are often used as operators and are particularly susceptible to long-term damage from poisoning.</p> <p>3. Brazil has no policy and institutional framework for market exchange of water rights. Such a market is especially needed where water is scarce to encourage efficient water use in agriculture and urban industry.</p> | <p>Other states need to undertake similar programs based on micro-basins. Further extension effort needs to be made in promoting low-tillage or no-tillage agriculture and other forms of on-farm conservation.</p> <p>Step up efforts on dissemination of the proper use and protection from pesticides, focussing on the detrimental effects on children. Alternative, less toxic, pesticides should be recommended to operators. Federal Government should define a strategy to selectively support better monitoring and enforcement at State level.</p> <p>The government should analyze the options available and establish a legal and institutional framework for market exchange of water rights.</p> |
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AGRICULTURE, RURAL DEVELOPMENT AND NATURAL RESOURCE POLICY

Policy Balance Sheet

IMPROVEMENT	MACROECONOMIC FACTORS	LITTLE CHANGE	WORSENERD
1. Untargeted and poorly targeted producer and consumer subsidies have been sharply reduced.	2. Heterodox approaches to macroeconomic stabilization are possible through the use of commodity minimum price schemes that are still on the books. This provides the potential for policy reversals.		3. Negative and cumulative impact of macroeconomic instability on private sector and government. 4. Even essential public services are losing qualified staff (EMBRAPA, IBAMA, rural health services). 5. Macroeconomic instability is likely to interfere with implementation of agricultural agreements within MERCOSUL. 6. Government has resumed importing primary goods in order to provide price stability to support the macroeconomic stabilization program.

IMPROVEMENT

- 7. Government's role in stockpiling commodities is greatly reduced.
- 8. Direct and indirect discrimination against agriculture in exchange rate and trade policy has been sharply reduced, (QRs eliminated, tariffication implemented).
- 9. Most marketing parastatals and constraints to private sector marketing systems have been eliminated.
- 10. Deregulation of trucking industry has occurred.
- 11. Brazil has made a major contribution to multilateral negotiations on agricultural trade liberalization.
- 12. MERCOSUL is contributing to the harmonization and reduction of nontariff barriers in agriculture.

TRADE AND PRICE REGIME

LITTLE CHANGE

- 13. Agricultural machinery and equipment are still excessively protected.
- 14. Port costs remain among the highest in the world.
- 15. Anti-dumping and countervailing duty rules and implementation capacity remain undeveloped, and the importance of these has greatly increased under tariffication.
- 16. Mechanisms for hedging price risks are still under-developed even though they are much more important now (for example, the bonded warehousing system is still undeveloped with adverse effects on credit and hedging).

WORSENERD

- 17. Instruments of government intervention in commodity markets are still in place: consumer price controls; minimum producer prices; export controls on sugar and ethanol; and others
- 18. Increasing inconsistency between price support system/minimum price program and tariffication. This forces a decision/opens opportunity to revise price intervention system.

IMPROVEMENT

- 19. Restrictions on imports of methanol have been relaxed allowing for more exports of sugar.

SUGAR/ETHANOL POLICY

LITTLE CHANGE

- 20. Emphasis on quantitative controls in sugar/ethanol industries remains fully intact.
- 21. Sugar and ethanol prices are set without reference to world prices.
- 22. Pricing is based on costs of production which limits efficiency gains in the industry.
- 23. Restrictions on entry to and exit from the sugar industry remain.

WORSENERD

- 24. Failure to respond to improving opportunities to export sugar has raised the social cost of the sugar/ethanol policy
- 25. Failure to recognize ethanol export opportunities associated with air pollution increases the costs of the program

PUBLIC FINANCE

IMPROVEMENT

LITTLE CHANGE

WORSENERD

25. The management collection of the agricultural land tax has improved.
27. There is greater equality in treatment of agricultural income for personal and corporate income tax.
28. Tax revenues have been massively decentralized.
29. Inter-regional equity in access to tax revenues has increased.
30. Federal expenditures on rural infrastructure (except roads) have been maintained.
31. Immediate write-off of fixed agricultural investment has defeated the intention of the agricultural income tax reform.
32. Corporate tax rate of agricultural income is still lower than for non agricultural income, encouraging "verticalization".
33. The ICMS still discriminates against exports and distorts inter-regional allocation of production.
34. Lands under native forests are still subject to higher land tax than are deforested lands.
35. Cost recovery in National Parks remains minimal.
36. Financing of primary education out of a payroll tax remains highly inappropriate.
37. No transfer mechanisms for fiscal resources to small rural communities outside of the municipal center exist for productive investment or social services.
38. Community initiatives continue to be constrained by highly paternalistic fiscal and implementation mechanisms.
39. Multiple, convoluted and leaky transfer mechanisms continue to exist for education finance.
40. Public sector regulations constrain the contracting of executing functions in conservation, agricultural development and delivery of social services to private sector, communities and NGOs.
41. Federal expenditures do not contribute to inter-regional or inter-personal equity.
42. The shift of the agricultural social security tax from an output base to a wage base has made it virtually uncollectible and introduced distortion against labor and labor intensive crops.
43. Remaining federal government expenditures are not well targeted to poverty alleviation and ecological concerns, and there is insufficient use of matching grants to leverage state and municipal expenditures towards rural poverty reduction and ecological objectives. There is increased reliance on regulations rather than on incentive mechanisms to achieve these objectives and decreased capacity to enforce the regulations.
44. The revenue sharing system maintains or improves inter-regional equalization but reduces incentives for own-revenue generation of states and municipalities.
45. State and municipal expenditures for health, education and water supply are not targeted to the rural poor.
46. Rural road construction (non-frontier) and maintenance has declined.

RURAL CREDIT

IMPROVEMENT

- 47. Real interest rates on rural credit are positive.
- 48. Program costs have declined.

LITTLE CHANGE

- 49. Agreement has been reached in principle on removing subsidized credit for agriculture but no strategy nor political commitment has developed.
- 50. FINOR credit is not targeted to the poor in the NE region.

WORSENERD

- 51. The concentration of the beneficiaries of the credit programs has increased.
- 52. FINAME is now available to agricultural sector thereby making agriculture more capital intensive and further biasing agriculture against labor.

EMPLOYMENT AND POVERTY REDUCTION

IMPROVEMENT

- 53. Social security benefits have been extended to rural workers.
- 54. There has been a decentralization of health programs from federal to state and municipalities.
- 55. The government has demonstrated flexibility regarding the participation of NGOs and the private sector in the delivery of health services.
- 56. Allocation of land to indigenous groups has improved.

LITTLE CHANGE

- 57. Land and labor laws, credit subsidies, and regulations still reduce employment and self-employment opportunities in agriculture and total factor productivity.
- 58. Pesticide poisoning uses have not declined, monitoring and enforcement remain almost non-existent
- 59. The existence of parallel state and municipal primary education systems undermines rural education and resource allocation to rural schools.
- 60. Per pupil expenditures in rural schools of poor municipalities remains especially inadequate.
- 61. There is no specific strategy for the improvement of rural education at any level of government.
- 62. There is a lack of clarity in the criteria for receiving health funds from FNS which has lead to a politicization of resource allocation.
- 63. There are no targeted nutrition programs for poor and vulnerable high risk groups (pregnant and lactating mothers and children under 3).
- 64. State and municipal water companies remain oriented toward the urban areas while rural communities remain incapable of maintaining adequate drinking water services under current rules, and institutions, and cost sharing and recovery arrangements.

WORSENERD

- 65. Agricultural wages have fallen substantially.

RESEARCH AND EXTENSION

IMPROVEMENT

66. Agricultural extension has been decentralized.

LITTLE CHANGE

67. Targeting of extension expenditure for small holder agriculture is inadequate.
68. Extension for soil management is inadequate.
69. There is very little cost recovery in public research and extension.
70. No extension exists for small forestry/agroforestry.
71. The public extension service does not service the needs of small forestry.
72. Research expenditures on native forests remain inadequate.
73. Policies towards Indian groups has not addressed their interest in balancing conservation and development objectives.

WORSENERD

74. Sanitary and phyto-sanitary systems framework and implementation capacity have worsened.

CONSERVATION, FORESTRY AND BIODIVERSITY

IMPROVEMENT

75. The rate of deforestation in the Amazon has declined.
76. Federal expenditure no longer contributes to frontier expansion.
77. Fiscal incentives for plantation forestry have been abolished.
78. Fiscal incentives for agricultural development in the Amazon are subject to stricter environmental controls.
79. Application of environmental assessments has increased.
80. The area under environmental set-asides has increased.
81. The technical basis for agro-ecological zoning has been established in most states.
82. Much greater NGO finance and activity in conservation is now occurring.

LITTLE CHANGE

83. Forest legislation does not distinguish between native and planted forests.
84. Several overreaching or unenforceable forestry regulations are still in place, e.g. 20%-50% rules, PIFI, cut controls on planted forests.
85. Road construction of states and municipalities in the amazon is only partially under control.
86. Spending priorities for conservation of biodiversity have not been clearly defined.
87. No targeted incentives exist to encourage reforestation of slopes and along water-courses where externalities are large.
88. Management of conservation units remains poor.
89. Management systems for national forests remain poorly defined.
90. Property rights to forest, water and mineral resources in Indian reserves are still undefined, leaving access essentially open and unregulated.

WORSENERD

91. Available financial resources for nature conservation are not being spent.
92. Reforestation cesses collected from users of forests are not effectively spent by the federal government.
93. No money exists to buy land for acquisition of conservation units.

LAND MARKETS AND LAND MANAGEMENT

IMPROVEMENT

LITTLE CHANGE

WORSENER

94. Land prices have fallen relative to land rents probably as a consequence of indexed financial instruments.
95. Security of land ownership has increased due to decreased risk of expropriation.
96. The ceiling on allocation of government land to individuals and corporations has been reduced from 3000 to 2500 hectares with much stricter rules for exceptions.

97. Remaining distortions in the income tax code and the absence of long term capital for land purchases still make it very difficult for the poor to buy land.
98. Land allocation and titling rules still encourage deforestation.
99. A policy for allocating remaining *terra devoluta* in the Amazon to competing uses has not been defined.

100. Government capacity to distribute land has diminished.

SOIL, WATER, AGROCHEMICALS

IMPROVEMENT

LITTLE CHANGE

WORSENER

101. No further improvement in attention to sustainable land management issues since the mid-1980s.
102. Pesticide poisoning still occurs especially among children.
103. There are no market mechanisms for the allocation of water.

ADVISORY PANEL ON AGRICULTURE AND NATURAL RESOURCE POLICY

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Gervásio de Castro Resende	Rio de Janeiro	Agricultural Policy
Eneas Salati	University of São Paulo, Piracicaba	Global Change in the Amazon Basin
Yoni Sampaio	Federal University of Pernambuco	Nutrition

ADVISORY PANEL ON AGRICULTURE AND NATURAL RESOURCE POLICY

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Henrique Monteiro de Barros	Fundação Joaquim Nabuco, Recife-PE	Targeted Poverty Programs
Geraldo Sant'Ana de Barros	USP-FAELQ, Piracicaba, SP	Public Expenditure
José Reinaldo del Bianco	COPERSUCAR, São Paulo	Sugar and Ethanol
José Luis Carvalho	University of Sta. Ursula, Rio de Janeiro	Agriculture Policy, Rural Finance
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Túlio Durán	Universidade Santa Ursula, RJ	Agricultural Credit
Antônio Dias Leite	Foundation for Sustainable Development, Rio de Janeiro	Forestry Law
Phillipe Lena	Museu Paraense Emilio Goeldi, Belem, PA	Amazonas Issues
Mauro de Rezende Lópes	Consultant, Brasília	Agriculture Policy
Antônio Rocha Magalhães	ICID, Brasília	Rural Development in NE
Paulo Nogueira Neto	Former Secretary of Environment	Environment
Sylvio Péllico Netto	Universidade Federal do Paraná	Forestry
Maria Tereza Jorge de Pádua	FUNATURA, Brasília	Conservation in Brazil
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