

CEDI - P. I. B.
DATA 31 / 12 / 87
COD. 10000677

DEC 28 1991

THE STATE, EXTRACTIVE ECONOMIES, AND THE PROGRESSIVE
UNDERDEVELOPMENT OF THE BRAZILIAN AMAZON*

Stephen G. Bunker
Department of Sociology
326 Lincoln Hall
UIUC

* Research for this study was supported by a grant from the Universidade Federal do Pará while I was a visiting professor of its Nucleo de Altos Estudos Amazonicos from 1975 to 1978 and by grants from the Tinker Foundation and from the Center for International Comparative Studies at the University of Illinois at Urbana-Champaign in 1980. Jane Adams assisted greatly in the preparation of this paper.

Introduction

Recent paradigm shifts in theories of development and underdevelopment have been remarkable in the intensity with which earlier paradigms have been attacked. The advocates of structural explanations of underdevelopment were still writing epitaphs which claimed the modernization theories had succumbed to their own ideological and cultural biases (Frank, 1967; Wallerstein, 1976) when they themselves were attacked for vulgarizing the Marxian categories they had incorporated into their own theories of unequal exchange (Laclau, 1971; Weeks and Dore, 1979). This second controversy, which revolves around the relations between modes of production and modes of exchange, has been carried on at an extraordinarily high level of polemic and abstraction. This study is intended to introduce some concrete data into the debate. It addresses the proposition that the internal dynamics of extractive export economies progressively impoverish both the social and natural environments on which they depend. It examines this idea through analysis of commodity extraction and exchange in a single underdeveloped region, the Brazilian portion of the Amazon Basin.

An insistence on the primordial importance of modes of production has been a central theme in Marxist criticism of the various theories which present unequal exchange as an explanation of underdevelopment (Laclau, 1971; Mandel, 1975; Weeks and Dore, 1979). While these criticisms have indicated some conceptual problems in the more extreme statements of dependency such as Frank's (1966), their claim that orthodox Marxian paradigms can fully account for underdevelopment tends to simplify or ignore crucial historical processes. World-system approaches to the same problems (see Wallerstein 1975, Brockway, 1979), as well as attempts to analyze modes of production in dependent regions (see esp. Long, 1975) make it clear that however well particular modes of production

may characterize different levels of development, a clear emphasis on exchange is crucial to understanding the articulation between the various modes of production which make up regional, national, and international economies.

Neither the Marxian critique nor the response that modes of production are articulated through unequal exchange relations deal with one of the central issues in their debate--the progressive underdevelopment of certain peripheral or satellite regions. Marxian notions about the progressive development of productive forces appear to hinder their analysis of such areas. The concept of unequal exchange does not adequately discriminate between slower rates of development and progressive underdevelopment. In this paper I argue that, while unequal exchange is a key factor in progressive underdevelopment, its effects on a region's economy depend on and vary with the internal dynamics of particular economies as they respond to external trade.

While full analysis within a dependency or world systems perspective requires attention to the effects of unequal exchange on both the center and the periphery (Brockway, 1979), analysis of production and exchange in the extreme peripheries provides the most rigorous test of the current Marxist contentions that a focus on politically enforced, unequal exchange is an unnecessary and erroneous addition to the set of categories and concepts which they customarily employ. There are a number of extreme peripheries in the modern world system where historical analysis might demonstrate the extent to which underdevelopment results from and is maintained by such unequal exchange.

The Amazon River Basin of Brazil is the largest of these. It is particularly interesting because it constitutes a periphery not only within a world system but also in relation to the more developed south-central areas of Brazil itself. (Bunker, 1978, 1980a).

Brazilian Amazonia has been the scene of massive and destructive

interaction between the demands of the world economy and the natural environment since its initial colonization. The despoliation of nature has been increasingly reflected in the exploitative and destructive forms assumed by social relations in the region. Indigenous peoples have been subjected to a continuing process of economic expropriation and cultural oppression, parallel in many ways with the North American experience, while the peasant population of the area has suffered different but related forms of exploitation.

Present government programs promote large-scale ranching, lumbering and mining in the Amazon by building roads and dams, by providing massive fiscal incentives for private enterprise, and by importing capital-intensive technologies for the rapid transformation of natural resources into exportable commodities. These programs have accelerated the devastation of the world's largest tropical rain forest and most complex biotic system, the disruption and frequent extinction of indigenous societies which are especially vulnerable because of their finely balanced relations with their natural environments, and the expulsion of peasant communities from the land (Goodland and Irwin, 1975; Matthews and Davis, 1977; Hecht, 1978; Mahar, 1979). These programs and their drastic consequences do not, as Davis (1977) claims, result simply and directly from the collaboration of an authoritarian military regime with international capital and multinational corporations, nor, as some Marxists would suggest, from a transfer of value from a non-capitalist to a capitalist mode of production. Instead of developing forces of production, present development policies continue and intensify the destructive and self-limiting extractive uses of the Amazon's social and physical environments which Portuguese colonizers initiated and which subsequent forms of domination and exploitation have maintained.

This destruction, and the eventual impoverishment of successive groups of destroyers, has important lessons to teach about the dynamics of extractive

economies, and about the ways systems of unequal exchange can progressively destroy forces of production and the natural resources which these forces might transform for human use.

I will argue in this paper that certain characteristics of purely extractive economies lead to progressive underdevelopment through unequal exchange relations, and will attempt to show how the cycles of response to external demand for extractive commodities which progressively impoverished the Amazon's natural and social environments by decimating large stable indigenous populations in order to maintain colonial trade in wild spices, fruits, and animal products, and the lack of articulation with other economic systems which contributed to the eventual collapse of the rubber trade, are being repeated in Brazilian government programs for promoting the exploitation and export of natural resources in ways which maintain unequal rates of exchange and reinforce the Amazon's peripheral position within the nation.

Extreme Peripheries and Extractive Economies

Extreme peripheries may best be characterized as regions whose economic ties to the world capitalist system are based almost exclusively on the exchange of extracted commodities, that is, of resources which occur in nature and in whose existence or continued reproduction there is no deliberate human intervention. Examples of such commodities include not only petroleum and minerals, but lumber from natural forests; the oils, meats and hides of wild animals; nuts of undomesticated trees, most fish, and slaves. While processing the industrialization of most of these commodities create additional value, extreme peripheries such as the Amazon tend to export them raw or unfinished. Even this limited economic participation tends to be unstable, however.

Brockway (1979) has shown how the development of the botanical and related sciences responded to and promoted the transfer of plants which provided

extractive commodities in the extreme periphery to semi-peripheries where center nations controlled both the land and the labor necessary to transform these cultigens into plantation crops. Successful transfer to a plantation system brought these plants into a mode of production in which increased scale progressively reduced unit cost to levels at which extractive systems could no longer compete. These plantation systems frequently aggravated the impoverishment of other extreme peripheries by requisitioning labor, slave or indentured. These extreme peripheries' incorporation into the world economy, then resulted not in a transfer of value, but rather in a direct transfer of resources--both natural and human--to less peripheral regions.

Extreme peripheries suffer progressive underdevelopment because the dynamics of scale in extractive economies function inversely to the dynamics of scale in the productive economies to which world trade connects them. Key to the Marxian notion that the forces of production develop progressively is the fact that, in capitalist systems, the unit cost of commodity production tends to fall as the scale of production increases. In extractive systems, on the contrary, unit costs tend to rise as the scale of extraction increases. Greater amounts of any extractive commodity can be obtained only by exploiting increasingly distant or difficult sources. Though technological innovation may reduce costs of some extractive processes in the short run, unit cost of extraction will continue to rise in the long run. A central thesis in my argument is that, when extractive systems respond to increased external demand, they tend to impoverish themselves 1) by depleting non-self-renewing resources; 2) by exploiting self-renewing resources beyond their capacities for regeneration, and 3) by allowing the unit cost of commodities to rise so high that the development of synthetic or cultivated alternatives in other regions becomes cost effective.

Successful plantation or industrial production of formerly extractive

commodities completes the cycle of peripheral impoverishment by introducing progressive economies of scale which eventually eliminate or seriously reduce the original and increasingly costly extractive economy. A related thesis is that because there is little or no horizontal integration with other economic activities in an extractive export economy, control over exchange systems and profits tends to be highly concentrated, with little or no productive investment of the surplus.

The extractive cycles based on the crude extraction of animal oils and spices decimated both the natural resources indigenous societies and the technological systems which sustained them. The resulting scarcity of labor was a major constraint to the development of a cost-efficient rubber economy and thus a factor in the eventual loss of the Amazon's dominance in the international rubber market (Bunker, 1980). Present Brazilian government policies are simply extending new form of these earlier extractive modes and accelerating them by providing vast amounts of capital, to the dominant groups which organize them.

The State and Amazonian Extraction

The initial mode of extraction, imposed and supported by colonial intervention, was organized by various dominant groups to respond to center demand for spices and animal oils. Following its collapse and a long period of stagnation, a new extractive mode was organized by a fraction of the locally dominant class to take advantage of center demand for rubber. It required, as had the prior mode of extraction, direct articulation of these locally based dominant groups with buyers from the center, despite the Amazon's formal inclusion within the Brazilian state. Increasingly, however, these relations became mediated by the Brazilian state as the Brazilian economy itself became more highly capitalized, more autocentric, and more industrial. As the Brazilian state availed itself of technologies developed within the capitalist center, it enhanced its own transport, communication, and administrative capacities and became able to extend these capacities toward its own geopolitical frontiers. State mediation and intervention has not led to economic and political incorporation of the Amazon into the Brazilian nation, however. The depopulation, environmental disruption, and demographic and economic dislocations brought about by the previous modes of extraction created the conditions for both large-scale capitalist enterprise and government economic planners to treat the Amazon as an empty frontier from which profits could be rapidly, and wastefully extracted, with little regard for, or sustained economic participation by, existing human -- social and economic -- or environmental systems. The purpose of the present analysis is to show that while contemporary modes of extraction in the Amazon have increased gross regional income, they have done so in ways which will lead to their own collapse and which are so disrupting ecological and human systems as to limit the possibility of future modes of production to respond to new opportunities for either economic exchange or sound reproduction.

State intervention in the Amazon has followed two main policy imperatives; the first, the direct promotion of revenue generating economic activities, and second, the maintenance of order through the assertion of legitimate state authority. The first imperative predominated in government policy through the 1960's, then in the early 1970's the state initiated a sustained attempt to control and direct the capitalist expansion which its own policies had stimulated. The second imperative has consistently been subordinated to the first, however, both through the termination of certain control and social welfare programs and through the redirection of the programs that have survived. The directions and changes in government policy have been very much influenced, however, by the form of government intervention. The presence of the national state in the Amazon has been realized through the activities of various specialized bureaucratic agencies. Many of these agencies function over the nation as a whole, while others are organized as regional bodies, but with final control held by the federal government. The structures of these organizations were essentially extensions of structures which had emerged in the dependent capitalist industrial mode of production of the Brazilian national center, although the representatives of these agencies were placed in local positions in which they made locally oriented decisions. This situation was paralleled in those locally based economic activities which were also affiliates or dependents of larger companies elsewhere in Brazil or in the world.

As in previous cycles, external political forces established the position and supported the power of locally dominant groups. Changes in communication and transport technology tied these representatives of extra-regional corporations and governments much more closely to the controlling agency than had been the case of colonial agents, or of the aviadores in the rubber boom. These groups did, however, also become local actors, transforming local modes of production in

response to external demand.

The changes in both world and Brazilian economic and political systems which affected the Amazon have been sufficiently documented in other works that no more than a schematic outline is required here. Throughout the present century, nationally accumulated finance and industrial capital emerged from and increasingly lessened the relative importance of the export of primary goods such as coffee. The state increasingly participated in fostering and protecting export economies, starting with coffee as early as 1830 . It deliberately pushed to break out of an economy which was seen as excessively dependent on primary exports and too susceptible to declining terms of trade by turning, after World War II, to a policy of import substitution which depended on attracting foreign investments. The shifting balance of political and economic power from agrarian classes and regions to industrial classes and regions precipitated political crises, which were aggravated by major differences in regional rates of development. Regional resistances to national centralization of power, the increasing subordination of agriculture to urban-industrial food and capital requirements from the 1950's onward, and the increased concentration of land and displacement of peasants created major social tensions and fostered violence in many rural areas. In 1964 the populist government of Goulart, which had permitted and sometimes encouraged political action by workers and peasants, was overthrown by a centralizing authoritarian regime. This regime increasingly allied itself with international capital and attempted to provide an attractive and secure environment for it. During the entire post-War process of industrialization, but accelerated with the institution of the centralized authoritarian regime, new institutions and government agencies emerged which were designed to articulate the increasingly interdependent sectors of the economy by, among other things, fostering the greater

capitalization and market integration of agriculture. These processes had three central effects which were crucial to the ways that the national state mediated between the Amazon and world demand for a limited number of resources.

The first of these was a close alliance between the state and both international and national capitalist sectors, in which each of the three depended closely on the other two despite significant oppositions and conflicts within this alliance. It is especially important to note that this alliance, together with the autonomous development of both the state and of local industry, had strengthened and expanded all members of the alliance (Baer, 1979; O'Donnell, 1972, 1977, 1978 ; Cardoso, 1975 ; Evans 1975).

The second effect was that the state apparatus had evolved in directions which responded simultaneously to the needs of the developing industrial base in the Brazilian center and to the needs of the state. The increasingly specialized and interdependent sectors of the economy, which increasingly relied on exports to finance a growing foreign debt, required the maintenance of order and the integration of the administrative apparatus. Banks and banking regulations became increasingly important in the handling of foreign trade and distribution of foreign bank loans, the management and control of multiple exchange rates and exchange controls, and in the manipulation of the different interest rates through which the state attempted to influence the direction of the economy. Banks also became central to national state initiatives and programs to overcome regional inequalities by providing special credits, subsidies, and fiscal incentives to private enterprise in the less developed areas of the country. (Baer, 1979).

The industrial sector increasingly needed predictable and cheap food, leading to social and political tensions based in the economic discrimination against small-scale rural producers. Piecemeal attempts to respond to these various demands

led to the proliferation of specialized agencies to facilitate particular aspects of the commercialization of agriculture. Barraclough (1970) attributes the proliferation of agricultural development agencies typical of many Latin American countries to the fact that dominant class interests are so strongly entrenched in the Ministry of Agriculture that the government is obliged to create special agencies to carry out rural development programs which do not directly serve these interests. A series of federal agencies were created to regularize land titles and to resolve tenure conflicts; special agricultural credit programs were established through national, regional, and state banks, a commission was established to set and administer minimum prices for staple crops, a public company was founded to assure warehousing facilities for crops, and a national level association subordinate to the Ministry of Agriculture with separate agencies in each state was established to provide rural extension services. Most of these specialized agencies emerged in response to particular needs in the rapidly industrializing center south. They corresponded to a particular type and stage of capitalism and reflected state intervention in the transformation of prior relations of production. They were functionally specific, oriented to commercialized agriculture within an increasingly industrial context, and employed "rational" procedures. These agencies, and the programs which they were carrying out, were all part of an attempt to modernize those parts of the Brazilian economy less affected by industrialization. Such modern, and modernizing, agencies emerged and functioned in modes of production which were increasingly modern and capitalistic, and at the same time were the vehicle whereby the state deliberately intervened to reorganize certain relations of production and of exchange in ways the state saw as compatible with, and preparing the conditions for, the progressive development of capitalist modes of production. Thus, these specialized agencies of the

state were geared to the modes of production predominant in the center-south region where they emerged and to the needs of the state there. They were not adapted to the non-capitalist modes of production and extraction of the new Amazonian "national" frontier.

The third effect has been the increasingly severe balance of payments problem caused by Brazil's strategies for dependent import substitution, coupled with increased costs of imported fuel.

These three effects -- the emergence of an increasingly powerful and administratively large and complex state apparatus whose power and size depends on its alliance with increasingly powerful national and international business interests, the evolution of the administrative apparatus toward the requirements of a modern capitalist industrial state and economy, and the growing foreign debt--have all had a major influence in the ways that the state, and its capitalist allies, have mediated between the Amazon and international markets.

During the past two decades the Amazon has increasingly been used as a stop-gap solution to imbalances in the Brazilian national government's programs for rapid industrialization and the socio-economic integration of the country, in particular the precipitous increase in foreign indebtedness caused by Brazil's heavy alliance on international capital. The Amazon has come to represent a great reserve of natural resources to government planners searching for ways to pay for this influx of industrial capital. Mining, lumbering, and ranching concessions granted to various multinational and large national corporations have been seen as an effective way of tapping these resources (Mahar, 1979). As in earlier historic periods, external pressures promoted new modes of production, based on the extraction and unfinished export of primary resources from the Amazon.

The state's goals for the Amazon were further complicated by its own

political preoccupations with territorial security and by internal order. As the idea of an Amazon rich in natural resources was incorporated into national economic policy, the fear that other nations might wish to control these resources developed as well (Reis, 1968; Tamer, 1970; Pereira, 1970).

Further, the mechanization of agriculture had swelled the ranks of the already numerous landless peasants in the Northeast and South-Central regions of Brazil, who started to settle in the Amazon in the 1960's (Velho 1976). The impoverished peasantry were a political embarrassment, which the opening of the Amazon promised to alleviate.

Central government plans for the Amazon, either as a solution to balance of payments or population problems, or as a vulnerable region to be protected, have led to various forms of investments there. Like the earlier extractive cycles, recent changes in the Amazonian economy have developed in response to international demand for raw products heightened by the acute need for foreign revenues because of import substitution industrialization and by direct government intervention and subsidization.

In this case, however, the effects of international demand, and the capacity of locally dominant groups to reorganize the human use of the environment and natural resources and of human energies were greatly enhanced by political and fiscal activities of the national government. The Amazon passed from being an extractive periphery of European and North American economies to being the peripheral frontier into which the dependent capitalism of Brazil expanded. Local actors still reorganized the physical and social environment, but this time they did so with the support of a powerful national state, and, in many cases, the support of the large corporations they represented. The particular response reflects a national mode of production in which groups of private entrepreneurs control both the economic and political resources to appropriate vast areas of land and

dislocate human population. Like previous cycles, this one has led to new prosperity, but this prosperity can only be transitory, because it depends on the disruption of the natural environment and on the dislocation of human populations. The result has been a relatively rapid growth in the regional product and in per capita income (see Table 1) but, as we will show in this section, this "development" has relied primarily on new variations of the old extractive economies, wedded to massive inputs of tax credits and other federal disbursements. It has not yet reached the income levels achieved during the rubber boom, and has little prospect of avoiding the same forms of collapse. Mining, large cattle ranching, and lumbering are all being promoted as ways which maximize short term profits and minimize the possibilities for long-term, self-sustained development.

Table 1 About Here

The central government has used two forms of stimulus to local entrepreneurs -- concessions of resource rights to foreign companies, and tax credits and fiscal incentives to Brazilian companies. Concessions to foreign companies were most significant prior to 1968, but local capital became more important as the industrial base of Brazil expanded. The government established a program of fiscal incentives to be administered by the SUDAM (Superintendency for the Development of the Amazon), which allowed firms to place up to 50 percent of their corporate tax debt in block accounts which could be used for investment in approved projects in the Amazon.

Both forms of stimulus attracted huge amounts of capital under extra-local control and were thus able to displace local economies without reabsorbing the displaced labor. (See Table 2).

Table 2 About Here

The earliest national government initiatives for generating foreign revenues in the Amazon were based on mining concessions to foreign companies. In the early 1950s, ICQMI, a consortium made up of Bethlehem steel (49%) and the Brazilian government (51%) began exploiting the manganese deposits in Amapá, the territory north of the Amazon delta. Tin mining started in Rondonia in the south western Amazon in 1959, but in this case was first undertaken by individual miners. (EMJ 1972:82)

Katzmann (1971:454) has characterized both the impact of these mining operations on the gross regional product and the limited secondary growth which mining stimulated in the rest of the economy as follows:

"The enclave nature of the mining economy is illustrated by comparing the growth of Amazonian output before and after mining began. Throughout the period 1947-1956, the region's output grew about 3.8 percent per annum, about 2 points below the national average, and only slightly higher than the Amazonian population growth rate. After 1956, growth spurted and began to exceed the national rate through 1963. If the value of mineral exports were subtracted from the post-1956 growth curve, the old trend line continues (Villela and Almeida, 1966: 177-179). If manganese or tin mining had significant multiplier effects, the subtraction of mineral exports would have left additional generated income above the old trend line. Direct evidence of import of feed and manufacturers into the two territories confirm more directly the enclave nature of mining (Katzman, 1971-454)."

Further, the development of mining has decreased the ability of this sector to absorb labor. While the value of production rose from Cr\$ 104,000 in 1960 to Cr\$ 1,149,000 (constant values, 1949 = 100) in 1968, total employment in mining had fallen from 1,831 to 596 (IBGE; 4, 410). This shift has largely been the result of government policy, based on the promotion of mining to help alleviate

Brazil's acute balance of payments problems. Fiscal incentives were made available through SUDAM to mining operations, and in 1971 the government prohibited placer mines in Rondonia, creating considerable unemployment there. With the encouragement of capital intensive extractive techniques, cassiterite production in Rondonia rose from only 61 T in 1957 to 6,909 T in 1978 (Anuario Estatístico), and is projected to reach 15,000 T or more by 1990 (Goodland 1980:13).

Actual production and export of minerals (see Figure 1 -- cassiterite and manganese value of production), as well as government and private investments in infrastructure and exploration have contributed heavily to regional income. In 1967, the federal government removed a clause limiting manganese extraction to 1,000,000 tons/year from its contract with ICOMI. (49% Bethlehem Steel, 51% Brazilian--EMJ 1972:82). In 1970, even before the large scale development of capital-intensive extraction, cassiterite made up 50.9 percent of total industrial income in Rondonia. Manganese made up 82.7 percent of industrial income in the territory of Amapá in 1970, rising from 687,358 T in 1957 to 1,606,696 in 1978 (Anuario Estastico).

Recent discoveries of extensive iron and bauxite reserves and major government initiatives to promote their exploitation will heighten the impact of mining on the Amazon's economy. Massive investments in exploration have already been made in the huge iron ore deposits in the Serra do Carajas, the rich bauxite deposits on the Trombeta River, and kaolin deposits in Jari, all in Para state. Projections for the amount of investment in the Serra do Carajas project range from U.S. \$1 billion (Mahar 1979:111) to U.S. \$ 4.3 billion (EMJ 1975:91), and in addition to the ecological destruction inevitably associated with actual mining, the 876-km railway "will . . . create an impact that will exceed its 70-m width"

(Goodland 1980:13).

The Trombetas bauxite development is anticipated to begin producing 3.35 million tonnes per year of high grade ores, rising to 8 million tonnes per year (Goodland, 1980:12), with its projected cost estimated at U.S. \$ 2.7 billion (EMJ 1975:101). Despite optimistic projections concerning minimization of ecological destruction at the Trombetas site, and ambitious plans to produce food locally to supply company personnel (Goodland, 1980:13), early evidence indicates this mining project will have a significant impact on a far larger area than that immediately involved in mineral extraction. The massive influx of personnel and the resulting strong market for beef at both Porto Trombetas and in neighboring Santarem has encouraged the deforestation of extensive areas of jungle for large-scale cattle ranching in the surrounding areas. Not only is the local economy become thereby tied to what is probably a relatively short-term boom cycle, but the prior, ecologically adapted cattle raising system, based on native grasses, is being displaced and the brazil nut groves and peasant agriculture that have been a major factor in the local economy are being eliminated (Bunker 1981).

The mining of non-renewable resources accounts for a major part of the increase in regional income. Minerals have directly contributed Cr\$ 375,169 (1975 values) to regional income in 1970, or 13.9 percent in the growth in regional income since 1960 (~~see table 000~~). Salaries for exploration, and for the management of government and private support programs have added indirectly to this impact. Mining has remained largely an enclave economy, generating few forward or backward linkages. The mines, and what urban infrastructure they foster, can be sustained only as long as the deposits remain. However, the manganese reserves in Amapa are rapidly approaching depletion, and the Trombetas bauxite deposit are expected to last only an estimated 65 years (Goodland, 1980:12). In its anticipated life-span, the recent boom economy may not even last as long as the 70 years which elapsed from the beginnings of the rubber boom in 1840 to its

collapse 70 years later.

The mining of non-renewable resources accounts for a major part of the increase in regional income. This activity will eventually deplete the resources on which it depends, and the associated infrastructure of docks, railroads, and residences which it has generated, and which have also contributed to regional income, will lose some, or all, of its present productive utility. Nonetheless, the ecological and demographic disruption caused by mining is small in comparison to that caused by the extension of new roads and by the lumbering and ranching which have followed them. Mining activities are restricted to relatively small areas, and their location depends on geological accident far more than on proximity to roads.

One of the major areas of government disbursement, and another important source of increased regional income since 1959, has been an ambitious program of road building to provide an infrastructure for the Brazilian government's development plans for the Amazon. Although it includes 59 percent of national territory, the Amazon Basin had no road connections to the south of Brazil until the late 1950s. The transfer of the capital to Brasilia, in the central part of the country, was a first step toward integrating the nation around its geographical center instead of along its coasts. From Brasilia, roads were built north to Belem, in the early 1960s, at a cost of CR \$3.8 billion (1978 values) (Mahar 1979:9), and to Porto Velho and Rio Branco at the south west end. In the 1970s, massive investments were made to connect the Atlantic coast with Peru, with one great highway running south of the Amazon river, and another planned along the northern perimeter, that was budgeted at CR \$400 million (1972 values) (Mahar 1979:19). These major road systems stimulated further expenditure on secondary and feeder roads. While the huge costs of these undertakings added directly and indirectly to regional income, their long-term economic contribution to the

region depends on the economic activities which they stimulate and sustain.

In this case, these activities have, as in previous cycles, been primarily extractive. In addition to accelerating the mining of non-renewable, and thus eventually depleted resources, the roads have stimulated predatory lumbering of valuable woods, with no attempt to replace them with equally valuable species, and large-scale pasture formation, which though not directly extractive, depends on nutrients released by cutting and burning huge areas of forest to plant exotic grasses. Lumbering and large-scale cutting and ranching have both had devastating effects on the natural environment and on rural populations.

The government's 1960 road-building programs opened up vast areas of sparsely-settled terra firme. Contact with the road-building crews and with the settlers who followed them brought a new wave of epidemics and violence to the indigenous groups which occupied these regions, and threatened the tenure and subsistence of isolated peasant groups which combined horticulture, extracting, hunting and fishing along the rivers which the roads traversed. (Davis, 1977, Moran, 1981). The new road system exposed the areas inhabited by these communities to a mode of production in which registered private property and access to complex bureaucracies and to capital comprised key components of the control over means of production.

By the middle of this century modern capitalist forms of production and exchange, together with their corresponding social relations and legal institutions, were firmly established in large parts of the agricultural and industrial sectors of the south-central region of Brazil. They were still incipient or non-existent in much of the Amazon, however, especially in the rural areas (see Santos, 1979; Sawyer, 1977). Neither the peasant cultivation and forest extraction which sustained the Amazon's rural production, nor the aviamento system

required or had developed the modern capitalist institutions of land registry and title, formal bank credit, or competitive markets for agricultural produce (Bunker, 1979). Land tenure institutions reflected the non-capitalist modes of production specific to different rural areas. The national civil codes on property functioned only in those areas, primarily urban, in which capitalist development required institutional forms permitting and controlling the registered alienation of land and its use in credit transactions. In the rest of the Amazon, rights in land were governed by customary usage or by a variety of deeds or authorizations, some dating back to the colonial era, others from state or municipal governments. Actual boundaries tended to be vague, even in deeds certifying legal ownership, though holding size might be specified. Due to the remoteness of these areas and the lack of commercial value of the land itself, transfer of land rights through sale or inheritance were frequently not registered officially. Informal institutions of land tenure based on occupation or use, and sometimes superior force, frequently superceded juridical forms of possession and transfer.

Credit institutions corresponded to both land tenure and commercial institutions. They were primarily based on personal recognition and trust, and were secured against a season's production rather than against real guarantees in land or other property.

Central government decisions to connect the Amazon to the rest of Brazil with highways caused drastic changes in land use. The completion of the Belem-Brasilia highway in 1959 provided access to unoccupied terra firme lands and enabled their communications with markets. This stimulated a massive immigration by dispossessed peasants from other regions, especially the Northeast, where mechanization and capitalization of agriculture had disrupted traditional forms of land tenure and created a growing rural landless class. While these new peasant settlements in the Amazon did exploit markets for terra firme crops such as upland

rice, to which the road provided access, their combination of extraction and hunting with agriculture, their forms of land tenure, and their exchange systems paralleled those of existing Amazonian peasant modes of production.

An influx of large ranching and lumbering enterprises quickly followed the peasant migrants. Using their greater political and economic power, and frequently force, they were able to take control of the land which the peasants had cleared and then to take advantage of the labor reserve which their expulsion from it created (see Velho, 1976; Ianni, 1977; Hebette and Acevedo, 1977).

The expansion of capitalist enterprise into these new lands disrupted the normal functioning of land-tenure institutions which were not adapted to treat land as a valuable negotiable commodity on the scale that these sudden changes required (Mendonca, 1977; Santos, 1979). The state government sold vast tracts of land in a disorderly and frequently corrupt fashion.² The cartorios, licensed land registry offices, were swamped both by legitimate requests to transfer properties flawed by previous, unregistered sales and inheritances and by demands to register and sell fraudulent titles. Banks were caught in the dilemma of increasing and profitable demand for long-term agricultural credit in a situation where the conventional guarantees -- titled property -- were either unavailable or unreliable. The banks exerted increasing pressure on both the state and the federal bureaucracies to legitimate the land claims of the large-scale capitalist enterprises which were borrowing money from them with little regard to the actual legal standing.

The establishment of an authoritarian and centralist regime in 1964 created the conditions for further disruptions and changes in land tenure institutions. In 1968, the central government, acting through the SUDAM, Superintendency for the Development of the Amazon, extended its program of fiscal incentives to large ranching enterprises in the Amazon (Mahar, 1979). As the SUDAM was not

obliged to consider the validity of titles for the land on which its enormous subsidies were to be applied, their immediate effect was to aggravate the already severe land tenure crisis. This absence of any tenure guarantees left both the newer and older peasant settlements extremely vulnerable to repeated expulsion by large enterprises from areas they had cleared (Velho, 1976). As Martins (1975) has explained, these settlements formed a highly mobile demographic front, providing cleared land and cheap labor for an expanding capitalist front which continuously displaced it.

The large ranching and lumbering concerns used various tactics, such as purchasing old or lapsed titles, forging and fraudulently registering deeds, buying state lands, or simply occupying the land, to assert legal claim to lands which the peasants had settled. In addition to thus subverting prior land tenure institutions, they also subverted the state's control of its own armed force. In collusion with local police and military detachments, they forced the peasants to abandon their lands by offering small sums for the clearing, building, and planting which the peasants had done, and then using violence to remove those who would not leave. (Foweraker, 1981; Pinto, 1978, 1980; Ianni, 1979.) Some of these displaced peasants remained as employees for the burning and clearing of land for pastures. Some pushed further into the jungle, disrupting settled indigenous groups, and started the process of clearing and eventual repulsion over again. And some, including many whose employment ended when the pasture clearing was finished, settled in the towns which sprang up along the highways and became part of a transhumant labor force migrating with the seasonal cycles of burning and harvesting, or moved to the already swollen larger cities (Cardoso and Muller, 1978).

The new towns along the highways offered these displaced peasants neither regular employment nor access to land. Because of their rapid recent growth and

general poverty, they also lacked sanitary, medical and educational services (Becker, 1977; Hebette and Acevedo, 1979). Few of the peasants were able to compete successfully for jobs in the large cities where unemployment and underemployment were already high. The situation of the transhumant laborers (peoes, volantes) has been perhaps the worst of all. Subject to exploitation, fraud, and violence by the middlemen (empreteiros, gatos) who contracted their work and transported them, neither their wages nor their working and living conditions were subject to any labor law or police supervision. Few ranchers or farmers were disposed to provide even minimally adequate shelter for workers who spent as little as three weeks in any one place. By 1975, an estimated 80,000 landless peasants were working in these conditions in the Amazon (Cardoso and Muller, 1978). The new roads greatly increased migration to the Amazon but the resulting population growth was predominantly urban (IBGE, 1977). Rural populations did grow, but the rapid advance of large ranches made them highly unstable -- they are composed primarily of "lifetime migrants" (Carvalho and Moreira, 1976).

The establishment of cattle ranches along the new roads devastated huge tracts of forest, provoked compacting and laterization of the soil, and created new microclimates--drier and hotter than previously--in the areas of most intense deforestation. These grass monocultures are highly susceptible to plant and pest invasion; their economic life may be as short as 8 to 12 years (Hecht, 1978). The areas cleared were too large to permit recolonization by plant species capable of recovering the soil, however, so these areas may be permanently lost to any future human use (Goodland and Irwin, 1976).

One condition of the fiscal incentive contracts was that the entire 50%--the legal maximum--of each project's land must be cleared (Pinto, 1978). In the case of the cattle ranches--the largest of which range from 300,000 to

over 600,000 hectares--this has involved huge areas. Neither the government nor the ranchers have been willing to invest the time or money necessary to cut and transport the vast timber resources in these areas, so the land is usually cleared by burning. Estimates of the useable wood thus destroyed run as high as 3,500,000 hectares (Pinto, 1978), out of a total of 6,600,000 hectares which have been cut and burned for pasture. Of the 14,000 kilometer by 70 meter ^{strip} bulldozed for the Transamazonian highway network, scarcely a single cubic foot of lumber was sold (Goodland and Tillman 1978:276, citing to Moraes Victor, 1975).

In addition to wasting lumber, extinguishing species, and ruining upland soils, pasture formation indirectly reduces varzea productivity. The soils eroded from the newly formed pastures flow down various of the Amazon's tributaries, where they are deposited in the slower waters of the confluences. The sediment creates a damming effect in the nearly flat lower rivers. This increases flood levels and delays the river's fall, thus impeding cultivation in large areas of the varzea, reducing growing seasons on the rest of it, and inundating riverine settlements which were previously above the normal high water level.

This wasteful use of land is sanctioned in other ways besides the SUDAM approval and financing of pasture formation. The various states can sell their public lands to private individuals at a legally established rate defined as "the value of the naked earth" (valor da terra nua). This means, essentially, that the state assigns value only to the land itself and not to anything, such as trees, which may be growing on it. The resulting low prices of the land, in turn, make possible the rapid profits which can be gained by burning off forest vegetation and planting pastures. Even when lumbering was

officially promoted following the second Amazon Development Plan of 1974, timber projects were not integrated with pasture formation, and simply used predatory methods in those areas which could be most profitably cut.

Unlike mining, large-scale cattle ranching has not directly contributed significantly to the growth of regional income. The rapid deterioration of pastures has kept herd-sizes and marketing low. Productivity is only slightly higher than in the traditional cattle raising systems based on natural grasses in rivering areas. Pompermayer (1979) concludes that the major attraction of cattle ranching for the large corporations in south-central Brazil is in the subsidies it provides them for land speculation; there is also some evidence that firms have been able to deflect some of the fiscal incentive moneys available to more profitable investments in other areas.

The fiscal incentives available to ranches do indirectly contribute to regional income, both in payments for goods and services by ranchers and in the growing government expenditures on salaries and facilities for the agencies which disburse the fiscal incentives.

In fact, the growth in government expenditure is the largest single factor in the increase of regional income. The government has invested heavily to establish, maintain and staff a modern administrative infrastructure for its multiple development programs. Government expenditures have increased from 9 percent in 1960 to 24.2 percent in 1972 (Mahar, 1979). The next largest increase includes the privately employed lawyers, accountants, and economists, many of whom were formerly employed by the SUDAM and other government agencies, who work for consulting firms whose major business is to prepare plans and projects for companies which wish to seek fiscal incentives or who carry out special research projects for the government agencies (Mahar, 1979; 57 table 3.3).

Fiscal incentives have also been applied to industry, primarily in Belem and Manaus, the two largest cities in the Amazon. A Free Trade Zone was established in Manaus, so industries which locate there may benefit from both fiscal incentives and freedom from import tariffs. Even here, however, the results of fiscal incentive have not been altogether positive, nor do they promise to establish self-sustaining enterprise. These industries have tended to concentrate on capital intensive processes, frequently displacing prior labor-intensive enterprises. Further, the nature of the incentives distorts investment decisions, stimulating investments that are only profitable as long as the incentives are maintained. This results in an absence of either vertical or horizontal linkages between these industries and other dimensions of the regional economy and heightens the flow of income out of the area (Mahar 1979:134-5). The Manaus Free Trade Zone (FTZ), in particular, appears to diminish the "multiplier effects of public and private expenditures in the region (due to)import leakages" (Mahar, 1979:68) and has resulted in a chronic balance of payments deficit (Mahar 1979:144,147). The enclave, export-oriented, capital intensive industries encouraged by the policy of fiscal incentives and absence of import barriers does contribute significantly to regional income and product. These industries, however, tend to drain resources from the rest of the region, as well as acting as a "pole of attraction" for rural inhabitants, thus dampening economic activity in the rural areas, further attenuating internal commercial and productive linkages (Mahar, 1979).

There is little apparent linkage between the extractive and urban industrial economies, except for a limited amount of investment in wood products, encouraged by a strong international market for Amazonian timber (Mahar 1979:69). SUFRAMA approved 19 projects in wood products between 1968 and 1975, with an investment of Cr \$429.1 million (1975 values), or 11.3 percent of total projects

approved by SUFRAMA, which employed 3,747 people (Mahar 1979:155). SUDAM, up to mid-1976 had approved 17 new wood products projects and the expansion of 6 projects, with an investment of Cr\$ 972.7 million and Cr\$ 337.0 million (1975 values) respectively, or a total of Cr\$ 1,309.7 million (Mahar 1979:107). However, this production of wood and wood products made up only .1 percent of sales in the Manaus Free-Trade Zone in 1966, or Cr\$ 4.3 million (1975 values), falling to 0.2 percent in 1973, or Cr\$ 1.4 million (Mahar 1979:149).

This brief review of the effects of government financed infrastructure and of direct and indirect government subsidies to capitalist enterprise show that, far from breaking the Amazon out of the environmentally and demographically disruptive cycle of successive modes of extraction, government activities have intensified the rate and effects of extraction. Furthermore, the income effects of this most recent extractive cycle are no likelier to generate self-sustaining autonomous development than were the previous modes of extraction.

Regional income increased from Cr\$ 2,488.5 million in 1950 to Cr\$ 4,441.2 million in 1960 and Cr\$ 6,882 million in 1970 (1975 values). Increases in per capita income were less impressive, rising from Cr\$ 1,348 in 1950 to Cr\$ 1,707 in 1960 and Cr\$ 1,909 in 1970 (1975 values) (see Table 3). If the increase in income is disaggregated into the various sectors which most accounted for the bulk of this increase, however, it becomes quite clear that whatever development this income change reflects is of a politically precarious and self-limiting nature. Construction alone accounted for over 50 percent of the additions to the labor force in the secondary sector between 1960 and 1970 (Mahar 1979:41), or approximately 7 percent of the increase in the total labor force.

Table 3 About Here

Mining, which depletes the resources on which it depends, and which accounted for 15.3 percent of SUDAM-approved industrial investment through mid-1976 (Mahar 1979:107), accounted for 13.9 percent of regional income growth between 1960 and 1970, rising from .8 percent to 5.5 percent of regional income between 1960 and 1970. Government expenditure accounts for 23.6 percent of the growth during this same period. Fiscal incentives and tax credit disbursements from SUDAM alone equaled 20.7 percent of regional income in 1970, and equaled 58.4 percent of the increase in regional income between 1960 and 1970. Major investments in infrastructure, particularly road and dam construction have also contributed to the growth in regional income. For example, the Jari project, totally financed by the Brazilian subsidiary of National Bulk Carriers, estimated expenditures to 1979 at U.S.\$ 500 million, potentially reaching U.S. \$ 1 billion by completion of the project (Mahar 1979:111) while investment in the Transamazonian Highway and PIN were to average Cr \$ 756,800 a year beginning in 1971.

Thus, major portions of the growth in regional income are either dependent on government expenditure which may end with changes in policy, or are generated by extractive economies which will eventually terminate themselves. When these figures are adjusted for population growth of 195 percent (from 1,844,655 in 1950 to 3,603,860 in 1970), the per-capita income not directly dependent on mining, fiscal incentives, government service, and roads has actually declined. These results, moreover, have been brought about at considerable cost to the natural environment and to its future utility.

Until 1970, government policy toward the Amazon involved relatively unqualified and uncontrolled subsidies to large-scale capitalist enterprise. In addition to disrupting the natural environment, government policies disrupted local economies and populations and caused a series of violent conflicts over access to resources, and to the breakdown of local institutions of order and or land tenure. In this

situation, the state was impelled to attempt to control and direct the capitalist development which its own policies had stimulated. Simultaneously, it was confronting a situation of increasing social unrest and criticism due to the growth of a landless peasant class and its repression of this classes attempts at political organization in the Northeast. It attempted to respond to these two needs with a program which combined social welfare with political and institutional control.

The much discussed Transamazon colonization projects did constitute a departure from state policies of direct support for large-scale enterprise in the Amazon. For a brief period the state attempted to reduce the social and political tensions which the increasing number of landless peasants and the repression of peasant leagues and attempts at land reform in the Northeast had created by opening the Amazon to peasant settlement. These policies, however, were part of a more general attempt on the part of state to bring the rapid extension of capitalist activity under control by the various agencies of the state and within the institutional structure which functioned in the rest of Brazil. The social welfare programs were rapidly subordinated to the demands of the state's capitalist allies, but the control processes, aimed at maintaining state control and regulation of enterprise, have continued.

At the beginning of the 1970's, President Medici initiated a program to build a highway through the Amazon jungle, from the Atlantic coast to the Peruvian border. It was to support the settlement of 100,000 landless peasant families and was part of a larger Plan of National Integration (PIN). The announcement of the PIN was followed in 1971 by the Decreto-Lei 1.164, through which the government imposed national control of all state lands in a 100 kilometer deep belt on each side of any federal highway already constructed, in construction, or planned in the entire Amazon region (Smith, 1975; Moran, 1975; Goodland and Irwin, 1976; Davis, 1977; Bunker, 1978, 1980a). INCRA, the National Institute

of Colonization and Agrarian Reform, formed in 1970 by merging three lesser agencies concerned with land tenure and registration, was given control over these newly acquired federal lands with the responsibility of classifying tenure, surveying, selling or colonizing, and titling them.

The enabling legislation for INCRA stressed the new agency's responsibility to correct the land tenure crises which rapid capitalist expansion had caused in the Amazon. The bulk of INCRA's activities and budget from 1970 to 1974, however, was dedicated to the colonization plans for small-holding peasants along the Transamazonic Highway. INCRA was charged with selecting the colonists who were to receive 100 hectare lots, surveying and documenting these lots, providing perpendicular access roads from the newly opened highway, housing, access to bank credit, transport, warehouses, health services, education, and technical assistance. A series of other federal agencies received major additional budgetary appropriations to carry out some of these tasks under INCRA supervision (Bunker, 1979).

These agencies were all extensions of functionally specific agencies which had been established for other purposes in the modernized, south central regions. The bureaucracies depend on higher authority not only for the definition of their programs and procedures but also for their very existence. Programs of colonization and rural extension in the Amazon are generally administered by relatively minor units within larger organizations or by agencies which are themselves subordinate to and dependent on these larger organizations for authority and for funding. The subordinate position of the rural development programs reflects both their divergence from the central thrust of Brazilian development planning (with its emphasis on the concentration of income and the means of production) and the marginal and subordinate position the peasant and Indians which make up their clientele.

All of these agencies function through power derived--both as authority and

as funding--from different sources and at different levels of bureaucratic articulation. In no way were they accountable to a single central planning authority. In fact, the proliferation of convenios (funding contracts) often led to a situation where an agency was accountable to several different sources, reflecting a series of bargains between agencies and interest groups over budget and program (see Bunker, 1979). As a result, actual coordination of these programs was difficult. INCRA encountered numerous environmental, logistic, and administrative problems in coordinating all the various facets of these projects (Moran, 1975, 1977, 1981; Smith, 1976; Bunker, 1980). Its failure to solve many of them reinforced both private and public sector criticisms of the colonization programs and heightened their pressure for other applications of government resources and alternative strategies for occupying the Amazon (Wood and Schmink, 1979; Bunker, 1978).

SUDAM's criticism of the PIN and of colonization programs was particularly intense. As 30 percent of the income tax revenues for fiscal incentives were budgeted for the PIN from 1971 to 1974, the sudden emphasis on colonization posed an evident threat to the SUDAM's predominant position in the Amazon development programs and to the private sector interests benefitted by the fiscal incentive programs it administered. SUDAM's position was effectively supported by the lobbying efforts, pressures, and public statements of the Amazonian Association of Agriculture and Ranching Entrepreneurs, which had direct access to various ministries and the direct support of the powerful Minister of Planning (Cardoso and Muller, 1978; Pompermayer, 1979, 1980). The government responded to these private sector and government criticisms with a series of concessions to large-scale capitalist enterprise, primarily by re-orienting key programs and policies to favor large-scale ranching and mining operations oriented to the export market.

The colonization schemes and the policies restricting the size of landholdings in the Amazon were an immediate and relatively easy target. INCRA decided in 1972 to sell public lands in the Amazon to private interests. By 1976, two presidential "expositions of motives," 005 and 006, authorized INCRA to regularize titles of up to 600,000 hectares and 3,000 hectares respectively for large and medium enterprises whose "paralyzation might hinder the economic development of the region" (Santos, 1979).

With the publication of the second PDA, Plan for the Development of the Amazon (Brasil, 1975), the government explicitly abandoned the idea of developing the Amazon through the settlement of small farmers and emphasized instead the establishment of large, highly capitalized ranching and mining enterprises which supposedly would be more effective in generating foreign revenues. In contrast to the first development plan, which allocated 17.5 percent of SUDAM's investment expenditures to colonization and nothing to mining, the Second Plan decreased the colonization budget to 1.8 percent of investment expenditures and allocated 15.4 percent to mining (Mahar 1979:15). Well before the second PDA appeared, however, colonization budgets had been cut and the number of colonists to be settled had been reduced to one-fifth of the originally projected 100,000 families (Bunker, 1980a). Fiscal incentives quickly returned to and exceeded former levels.

INCRA maintained a minimal presence in the colonization projects and aimed at "emancipating" them, i.e., removing them from INCRA tutelage, as early as possible. INCRA's functions for the regularization of land title in ways compatible with the central Brazilian mode of production, i.e., in ways which guaranteed that land could be regularly alienated, negotiated, and used as collateral for production credit with minimal social tension through Projetos-Fundiarios and similar activities, were greatly enhanced.

Table 4

Thus, while social welfare programs declined, the state continued those programs which enhanced its own capacity to promote, regulate, and control productive activity, such as land titling and registry.

Other governmental attempts to mediate and regulate the social and ecological impact of the development it promotes have been as ineffective as its colonization programs. The absence of a strong local political voice, due to the lack of established and self-sustaining local enterprise, has weakened the efforts to balance the strong political influence of large scale capitalist enterprises. These local interest groups have been no more successful than were the elite groups and state governments which attempted to moderate the rubber boom's disruption of the regional economy.

FUNAI, the National Indian Foundation, is responsible by statute to guarantee the enforcement of various laws protecting Indian life and land, but has consistently yielded to road-building plans which reduce Indian lands below minimum size necessary to sustain resident populations. Roads--which promote peasant settlement, the extension of ranching, lumbering, and mining, and the spread of new diseases--directly threaten Indian life and land. (Goodland and Irwin, 1976; Davis, 1977). Roads, however, have been the keystone of government development programs and of business plans for the Amazon. FUNAI's incapacity to protect the Indians from the road-builders is one of the clearest examples of the subordination of agencies responsible for the preservation of the human and natural environments to other agencies charged with the promotion of rapid industrialization and capitalist expansion (Bunker, 1980b).

The IBDF, the Brazilian Institute for the Defense of the Forests, has been somewhat more aggressive in countering the private enterprises and government

agencies interested in large-scale deforestation. Individual large corporations and the powerful Amazonian Association of Agriculture and Ranching Entrepreneurs have responded, however, by attempting to undermine IBDF's authority to restrict and monitor forest clearing and to charge fees for its clearing authorizations. They have also proposed legislation which would define pasture as arboreal cover (Pinto, 1978; Bunker, 1980b).

IBDF has suffered similar difficulties in establishing and protecting national parks and forest reserves. Legally, IBDF is obliged to pay for the work and improvements of anyone who had been on reserved land for a year and a day. The first "cleaning" of a reserve is generally fairly simple: peasants are paid off and relocated. This payment, however, becomes an invitation to the so called "industry of possession" (industria da posse) in which someone settles in order to be bought out. As the commonest and quickest form of "improvement" is to burn and clear the land, the establishment of forest reserves quickens the destruction of the forest, at least in the short run. Frequently, this second wave of occupants is financed by local ranchers and businessmen with sufficient political power to make IBDF reluctant to prosecute on the basis of invasion of reserved land. Instead, it pays repeatedly for burned forest.

All of the bureaucratic agencies which government has employed to control and direct capitalist expansion have been subject to manipulation by the capitalist enterprises which other state programs and agencies are subsidizing, and all of these agencies' effectiveness is further limited by their extension of procedures which emerged from their specific functions in the capitalist mode of production already established in south central Brazil. Government programs designed to promote exports by securing rapid profits for favored business sectors have flourished, but in doing so they have contributed to the devastation of the human communities and the natural biotic systems on which any long-term

development must depend. Bounded by the legacy of earlier despoliation and confronted by the enormously greater political and economic power of local representatives of international capital, national business interests, and military advocates of "great nation" ambitions, the uncoordinated, understaffed, and underfunded special agencies for the defense of indigenous societies, peasant communities, and plant and animal resources are constantly subverted and marginalized. At best, they win temporary, and very occasional, holding actions. At worst, they serve as a flimsy facade which the government and dominant business interests can use to legitimate their export-promotion policies, pointing to these agencies as evidence of their good intentions and blaming these agencies' failures on the intransigence of the Indian, the lack of initiative of the peasant, and the intractability and hostility of nature itself (Bunker, 1978; Wood and Schmink, 1979).

Current official developmental programs and large-scale enterprise promise to repeat the history of the colonial conquest and of the rubber boom. By subordinating the requirements for long-term reproduction of the social and natural environments to immediate political and economic demands for the rapid transformation of natural resources into exportable commodities, government and business threaten an even more profound impoverishment of the Amazon as soon as these resources are exhausted.

Cattle ranches and development planners were able to treat the Amazon as an empty frontier because previous modes of extraction responded to international exchange opportunities in ways which prevented the development of more stable and profitable uses of social and natural environments. Colonial trade had destroyed the mixed extractive and horticultural economies which maintained ecological balance by exploiting a wide range of plant and animal resources before European conquest. Local responses to exchange opportunities in the

world economy restricted the range and increased the intensity of resource exploitation, in many cases beyond the capacity of species regeneration sufficient to maintain cost effective extraction. The consequent impoverishment and depopulation of the Amazon set the stage for the boom and collapse of the labor-short rubber trade and for the wasteful use of the Amazon as a huge, short-lived, and ultimately destructive pasture.

CONCLUSION

If one considers only the present conflicts between, for example, peasants, large ranchers and the state, it is possible to analyze social relations in the Amazon in terms of the articulation of different modes of production, in which value is transferred from the peasant mode to the capitalist mode below the cost of the reproduction of labor with the collaboration of a state whose agencies have been captured or penetrated by various capitalist class factions (Foweraker, in press; Pompermayer, 1979; Wood, 1980). Such orthodox Marxian concepts are less satisfactory, however, if one wishes to account for the reasons that mining, lumbering and large-scale cattle ranching, with their costly and destructive use of both human and natural resources, was able to spread virtually unchecked by competition from alternate uses of land and labor into a region which had maintained exchange relations with the world economy for over 300 years.

Effective use and development of natural resources depends on human organization, but such organization is impossible when short-term economic and political interests can completely disrupt settlement patterns and the ecological systems on which they depend. The decimation of populations during conquest and enslavement, the massive reimportation of human energy to satisfy international industry's needs for rubber, and the present expulsion of both peasants and Indians from the lands on which they subsist, in addition to preventing effective and continuous human organization, have been accompanied by increasingly severe

depredations of the natural environment. Each depredation, from the killing off of river fauna to the transformation of vast areas of forest into pasture of short economic usefulness and limited capacity for natural regeneration, has severely limited the potential for subsequent human settlement in economic use of the forest. By perpetuating the demographic void in the rural areas, the current exploitation of the Amazon in the interests of lessening the impact of international capital flows and maintaining short-term economic growth promises to restrict the usefulness of the Amazon for whatever purposes it might serve in the international and national economies of the future. Instead of allowing environmentally balanced strategies for long-term sustained yields, modes of extraction conditioned by politically determined relations of unequal exchange continue to limit the possibilities of social and economic development in the Amazon.

Extractive economies such as the pre-Columbian indigenous societies maintained may function well for societies bounded by their own ecosystem, but extractive economies geared to world trade tend to impoverish themselves. The case of the Brazilian Amazon shows that commodity circulation, and the means by which it is controlled, must be combined with analyses of modes of production and their articulation if we are to understand the progressive underdevelopment of extreme, or extractive, peripheries. Unequal exchange, however, is not itself a direct cause. Rather, it sets in motion dynamics inherent in the extractive economy itself. Self-bounded extractive economies may be able to maintain long-term ecological balance with their own environments. Unequal exchange may lead to progressive underdevelopment by disrupting this balance.

The role of the national state crucially influenced the forms in which Amazonian modes of production and extraction have been reorganized in response to international systems of unequal exchange. By providing both basic

infrastructure and large amounts of capital to large-scale capitalist enterprise, it has accelerated, and in some cases created, conditions which favor the rapid development of extractive industry, while its own attempts to direct and control the spread of capitalism along its own frontiers, and to maintain order in the relations between different claimants to natural resources, have been impeded by the use of bureaucratic structures which had evolved within the capitalist modes of production predominant in the central south regions but which were not adapted to the uses to which the state attempted to put them in the non-capitalist Amazon. The state essentially created the conditions for the subversion of its own bureaucratic apparatus by providing more power to capital than it was able to effectively administer.

References

Baer, Werner

1979 The Brazilian Economy: Its Growth and Development. Columbus, Ohio: Grid Publishing Company.

Cardoso, Fernando Henrique

1975 Autoritarismo e Democratização. Rio de Janeiro: Paz e Terra.

Cardoso, Fernando Henrique and Geraldo Muller

1977 Amazônia, Expansão do Capitalism. Sao Paulo: Brasiliense.

Cehelsky, Marta

1979 Land Reform in Brazil: The Management of Social Change. Boulder: Westview Press.

Davis, Shelton

1977 Victims of the Miracle: Development and the Indians of Brazil. New York: Cambridge University Press.

Fearnside, Philip

Forth- Carrying Capacity for Human Populations: Colonization in the
coming Brazilian Rainforest. Minneapolis: Burgess.

Foweraker, Joseph W.

1981 The Struggle for Land. New York: Cambridge University Press.

Furtado, Celso

1968. The Economic Growth of Brazil. Berkeley: University of California Press.

Frank, Andre Gunter

1969 "Sociology of development and underdevelopment of sociology."
Pp. 21-94 in Latin America: Underdevelopment or Revolution,
New York: Monthly Review Press.

Goodland, Robert J. A.

- 1980 "Environmental Ranking of Amazonian Development Projects in Brazil." *Environmental Conservation*, 7, 1:9-26.

Goodland, R. J. A., and Irwin, H. S.

- 1975 *Amazon Jungle: Green Hell to Red Desert?* Amsterdam: Elsevier.

Goodland, R., H. S. Irwin, and G. Tillman

- 1978 "Ecological development for Amazonia." *São Paulo: Ciencia e Cultura* 30(3):275-289.

Hebette, Jean and Rosa Acevedo

- 1979 *Colonização Espontanea, Política Agrária, e Grupos Sociais.* Pp. 141-192 in José Marcelino Monteiro da Costa (ed.), Amazônia: Desenvolvimento e Ocupação. Rio de Janeiro: IPEA/INPES Serie Monografica No. 29.

Hecht, Susanna

- 1979 "Spontaneous Legumes of Developed Pastures of the Amazon and their Forage Potential." Pp. 65-80 in Pedro A. Sanchez and Luis A. Tergas (eds.), Pasture Production in Acid Soils of the Tropics. Cali: CIAT. Cali, Col.

Ianni, Octavio

- 1977 A Luta pela Terra. São Paulo: CEBRAP (mimeo).

INCRA

- 1972 PIN. Colonização da Amazônia. Brasilia: INCRA.

Katzmann, Marwin J.

- 1974 "Paradoxes of Amazonian Development in a Resource Starved World." *Journal of the Developing Areas.*

Laclau, Ernesto

- 1971 "Feudalism and Capitalism in Latin America." *New Left Review*, 67 (May-June).

Mandel, Ernest

1975 Late Capitalism

Mahar, Dennis J.

1979 Frontier Development Policy in Brazil: A Study of Amazonia.
New York: Praeger Publishers.

Martins, Carlos Estevam

1977 Capitalismo do Estado e Modelo Político no Brasil. São Paulo:
Graal.

Martins, José de Souza

1975 Capitalismo e Tradição: São Paulo: Livreria Pioneira Editora.

Mendonca, Otavio

1977 "Prefácio," in Paul Lamarão (ed.), Legislação de Terras do
Estado do Pará. Vol. I, 1980-1983. Belém: Grafisa.

Moran, Emilio

1974 "The Adaptive System of the Amazonian Caboclo." Pp. 136-159 in
Charles Wagley (ed.), Man in the Amazon.

1975 Pioneer Farmers of the Transamazon Highway: Adaptation and
Agricultural Production in the Lowland Tropics. Doctoral
dissertation, University of Florida.

1979 "Strategies for Survival: Resource Use Along the Transamazon
Highway." Studies in Third World Societies 7:49-75.

1981 Developing the Amazon. Bloomington: Indiana University Press.

Pinto, Lucio Flavio

1977 Amazonia, o Anteato da Destruição. Belem: Grafisa.

1980 No Rostro do Saque. São Paulo.

O'Donnell, Guillermo

1972 Modernization and Bureaucratic-Authoritarianism. Berkeley:
University of California Press.

O'Donnell, Guillermo (continued)

- 1978 "Reflections on the Patterns of Change in the Bureaucratic-Authoritarian State." Latin American Research Review 1, 78:3-39.

Pompermayer, Malori Jose

- 1979 The State and the Frontier in Brazil: A Case Study of Amazonia, unpublished Ph.D. dissertation, Stanford University.

Sawyer, Donald

- 1977 "Peasants and Capitalism on the Amazon Frontier." Paper presented at meetings of the Latin American Studies Association, Houston, November.

Schmink, Marianne

- 1977 "Frontier Expansion and Land Conflicts in the Brazilian Amazon: Contradictions in Policy and Process." Paper presented at the American Anthropological Association Meetings, Houston, November.

Schuh, G. Edward

- 1971 O Desenvolvimento da Agricultura no Brasil, Rio de Janeiro: APEC Editora, S.A.

Silva, Graziano da

- 1978 Estrutura Agraria e Produção de Subsistência na Agricultura Brasileira. São Paulo: Editora Hucitec.

Smith, Nigel

- 1976 Transamazon Highway: A Cultural-Ecological Analysis of Colonization in the Humid Tropics. Doctoral dissertation, University of California, Berkeley.

Pereira, L. C. Bresser

- 1977 Estado e Subdesenvolvimento Industrializado. São Paulo: Brasiliense.

Reis, Arthur Cezar Ferreira

1968 A Amazonia e a Cobiça Internacional. Rio de Janeiro: Grafica Record Editora.

Santos, Roberto

1979 "Sistema de Propriedade e Relações de Trabalho no Meio Rural Paraense." Pp. 103-140 in José Marcelino Monteiro da Costa (ed.), Amazônia: Desenvolvimento e Ocupação. Rio de Janeiro: IPEA/INPES Serie Monografica No. 29.

Wallerstein, I.

1975 "Modernization: Requiestat in Pace." Paper delivered in Thematic Panel for the Concept of Modernization, meetings of the American Sociological Association, San Francisco.

Wood, Charles and Marianne Schmink

1979 "Blaming the Victim: Small Farmer Production in an Amazon Colonization Project." Studies in Third World Societies 7:77-93.

TABLE 7

Amazonia: Aspects of the Economically Active Population (EAP)—1950, 1960, and 1970

Category/Year	Sector						Total	
	Primary ^a		Secondary		Tertiary			
EAP (thousands)								
1950	405.3	(811.4)	36.8	(53.8)	138.3	(204.5)	580.4	(1,069.7)
1960	518.0	(1,169.4)	48.1	(71.3)	219.7	(335.2)	785.8	(1,576.0)
1970 ^b	593.6	(1,358.8)	109.7	(156.6)	319.1	(475.9)	1,022.4	(1,991.3)
Distribution (percent)								
1950	69.8	(75.9)	6.3	(5.0)	23.8	(19.1)	100.0	(100.0)
1960	65.9	(74.2)	6.1	(4.5)	28.0	(21.3)	100.0	(100.0)
1970	58.1	(68.2)	10.7	(7.9)	31.2	(23.9)	100.0	(100.0)
Annual growth rate (percent)								
1950-60	2.5	(3.7)	2.7	(2.9)	4.7	(5.1)	3.1	(4.0)
1960-70	1.4	(1.5)	8.6	(8.2)	3.8	(3.6)	2.7	(2.4)
1950-70	1.9	(2.6)	5.6	(5.5)	4.3	(4.3)	2.9	(3.2)

^aIncludes extractive mining.

^bExcludes persons seeking employment for the first time.

Note: Figures in parentheses represent the North and Maranhão (SUDAM).

Source: IBGE, Censo Demográfico, 1950, 1960, and 1970,

Taken from Mahar, 1979

40

TABLE 2

SUDAM and SUDENE: Industrial Capital-to-Labor Ratios of New Projects
(1975 prices)

Sector	SUDAM (Cr\$ thousands)	SUDENE (Cr\$ thousands)	SUDAM/ SUDENE
Mining	1,802.0	149.3	12.07
Manufacturing			
Nonmetallic minerals	471.4	188.4	2.50
Metallurgy	488.4	330.4	1.48
Electronics	130.7	108.2	1.21
Transport equipment	160.0	99.4	1.61
Wood products	133.4	154.6	0.86
Furniture	153.1	63.4	2.41
Paper	160.0	186.9	0.86
Rubber	1,076.0	233.3	4.61
Leather	117.0	166.3	0.70
Chemicals	297.5	491.2	0.61
Pharmaceuticals	328.8	201.9	1.63
Perfumery	348.0	183.6	1.90
Plastics	375.6	156.6	2.40
Textiles	75.1	194.7	0.39
Apparel	237.5	42.2	5.63
Foods	322.6	111.9	2.88
Beverages	217.8	201.9	1.08
Tobacco	9.6	31.9	0.30
Miscellaneous	164.7	91.5	1.80
Subtotal	207.3	193.0	1.07
Total	260.3	192.2	1.35

Note: Projects approved through mid-1976.

Sources: D. E. Goodman and R. Cavalcanti de Albuquerque, Incentivos à Industrialização e Desenvolvimento do Nordeste, Coleção Relatórios de Pesquisa, no. 20 (Rio de Janeiro: IPEA/INPES, 1974), pp. 249-50; IPEA/SUDAM/NAEA survey, Taken from Mahar, 1979

Table 3

Partial Disaggregation of Factors Affecting Growth in Regional Income

	1950	1960	% RI	Growth	% of GRI	1970	% RI	Growth	% of GRI	1975
Regional Income	2,488,500	4,441,216				6,882,048				
Growth in Regional Income		1,952,716				2,440,832				
Government ¹	---	339,709	7.6	339,709	17.4	915,312	13.3	575,603	23.6	
Belem-Brasilia (per year) ²	---	274,360	6.1	274,360	14.0	---				
SUDAM/SUFRAMA (per year) ³	---	---				1,425,900	20.7	1,425,900	58.4	1,425,900
SPVEA (per year) ⁴	---	365,667	8.2	365,667	18.7	---				
Minerals (at census year) ⁵	---	34,712	.8	34,712	1.8	375,169	5.5	340,457	13.9	
Black Pepper (at census year) ⁶	---	42,366	1.0	42,366	2.1	101,835	1.5	59,469	2.4	234,472
PIN (incl. transamazon) (av/yr) ⁷	---					---				756,800
PROTERRA (average/year) ⁸	---	---				---				2,523,000
TOTALS		1,056,844	23.8	1,056,814	54.1	2,850,678	41.4	2,401,429	98.4	(incomplete)

1975 values. Cr\$1000

46

Table 4

Indicators of Government Activities in Colonization Compared by Year with Indicators of Activities Related to Large Scale Enterprise

Colonization--PIC Altamira and Itaituba		Large Enterprise	
INCRA Budgets (Cr\$) ¹	INCRA Personnel	INCRA Land Tenure Classification--PF Altamira (Ha) ²	Fiscal Incentives SUDAM Disbursements (Cr\$) ¹
			632,758,447
1970			561,533,792
1971			424,298,206
1972	128,265,518	1,228	477,618,018
1973	159,330,205	1,651	487,391,435
1974	119,719,014	833	923,671,516
1975	112,065,111	700	652,922,274
1976	95,190,642	517	504,926,063
1977	39,700,639	248	

¹Values corrected to 1977 equivalents following Conjuntura Econômica, 324 (April) 1978: Index 2, Column 2.

²Two Projetos Fundiarios--PF Santarim and PF Cachimbo--were established within the original jurisdiction of PF Altamira in 1975 and 1977 respectively. Figures here include all three PFs.

Sources: INCRA CR-01, FF/FFP; SUDAM, DAI/DPOI.