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PUBLIC INTERNATIONAL LENDING INSTITUTIONS  
AND THE DEVELOPMENT OF THE BRAZILIAN AMAZON:  
THE EXPERIENCE OF THE WORLD BANK \*

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Introduction

As is well known to the participants in this conference, the design and implementation of projects directed to the orderly settlement and development of Amazonia is an exceedingly difficult task. It is made so by the special characteristics of the region: its fragile, and imperfectly understood, natural environment; its rapidly growing population, largely comprised of recent immigrants; its complex and fluid land tenure system; its highly-vulnerable indigenous population; and its acute shortage of basic infrastructure and the various production-oriented and social services. To make matters even more difficult, the remoteness and sheer immensity of Amazonia act as formidable barriers to the effective control and administration of the development process.

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Until recently, the experience of the World Bank in dealing with the development challenges of Amazonia has been quite limited. Several project identification teams were sent to Pará and Mato Grosso in the early and mid-1970s, but largely because of changing government priorities for the region -- from directed small-scale settlement to large-scale livestock and mining enterprises associated with POLAMAZONIA -- no Bank-financed projects emerged. (Contrary to popular thought, the World Bank did not help finance the Trans-Amazon Highway!). A \$6.7 million loan in support of a land settlement project in the pre-Amazon area of Maranhão (Alto Turi) was approved in 1972. However, since Alto Turi was administered by a subsidiary of SUDENE (called COLONE), it was more of part of the development strategy for the Northeast than for Amazonia.

The first major involvement of the World Bank in the Brazilian Amazon came only in 1979 when the government requested financial assistance for a proposed program aimed at promoting the integrated development of the Northwest -- a 410,000 km<sup>2</sup> subregion of "Legal Amazonia" comprised of Rondônia and 14 municípios located in the central and western parts of Mato Grosso. From 1979 to the present, the World Bank, with the cooperation of the UN Food and Agriculture Organization (FAO), has sent numerous technical teams to the proposed project area to assess the region's development potential and to assist with the preparation of projects suitable for external financing. Reflecting the complexity of the development task in the Northwest, such teams have been composed of a wide variety of specialists including: economists, agronomists, ecologists, foresters, educators, public health specialists, transportation planners and

engineers, anthropologists, sociologists and financial analysts. As a result of these joint World Bank-Brazilian efforts, three loans, totalling \$320 million, in support of POLONOROESTE (Programa Integrado de Desenvolvimento do Noroeste do Brazil), as the integrated development program for the Northwest became officially known in May 1981, were approved by the World Bank's Board of Executive Directors in December 1981. Two other possible loans, accounting for an additional \$75-125 million, are now being reviewed. 1/

Because POLONOROESTE is only now entering the implementation stage, little can be said about the real (as opposed to projected) future impact of this program on the region. A definitive assessment of this nature is still many years away. However, the experience gained with the design and preparation of POLONOROESTE is worth sharing. It not only illustrates some of the general problems associated with the development of tropical frontiers, but also provides insights into the particular opportunities and constraints faced by public international lending institutions working in the Brazilian Amazon.

#### The Origins of POLONOROESTE

By the early 1970s, it had already become apparent that the Northwest, particularly Rondônia, was among the most dynamic areas of Amazonia. The most visible signs of this were the tens of thousands of

1/ It should be pointed out that the World Bank does not normally finance the total costs of a development project. In the case of POLONOROESTE, the intention is for the Bank to finance about one-third of these costs.

migrants, mainly from the Northeast and South, who were entering the region via the newly-opened 1,500 km earth road (BR-364) linking the cities of Cuiabá and Porto Velho. Though the motives for this migratory flow varied, most of the new arrivals were seeking a plot of the fertile, unoccupied land that was purported to exist in Rondônia. During this period, INCRA (Instituto Nacional de Colonização e Reforma Agrária) established a number of colonization projects in Rondonia in an attempt to bring order to the settlement process, but soon found itself overwhelmed by sheer numbers. A growing awareness of this problem on the part of the government was one of the principal factors leading to the establishment of POLONOROESTE.

Although the paving of the Cuiabá-Porto Velho road (the Northwest's principal overland access route which is all but impassable during the October-April rainy season) had been considered by the Ministry of Transport as early as the mid-1970s, it was not until 1979 that the key elements of what was to become POLONOROESTE began to take shape. An important policy decision taken at this time was to integrate the paving of BR-364 with other measures aimed at promoting orderly agricultural development and settlement, based on small-scale farms, in the road's area of influence. The reasoning behind this decision was that the improvement of overland access to the Northwest by itself, while easing one of the major

development constraints of the region, could, by encouraging even larger migratory flows, exacerbate some of the negative effects normally associated with rapid frontier expansion (e.g., conflicts over land, accelerated deforestation, clashes between migrants and Indians, etc.).

Following the basic decision to pursue an integrated development approach in the Northwest, an interministerial working group, composed of representatives of the Ministries of Interior, Agriculture and Transport, was set up for the purpose of preparing a regional diagnóstico and of proposing specific settlement and infrastructure projects. The findings of this group were subsequently released in a two-volume report. <sup>2/</sup> Although hastily prepared, this document served to highlight in a preliminary manner the problems and development potential of the Northwest. It also stimulated a constructive debate in regard to the specific approaches that could be taken to bring order to the region's settlement and agricultural development.

### Regional Characteristics and Development Issues

#### The World Bank Regional Survey

In October 1979, at the request of the government, a ten-member World Bank team was sent to Brazil to review the report of the interministerial working group and to conduct its own broad socioeconomic

<sup>2/</sup> Ministries of Interior, Agriculture and Transport, Programa Integrado do Desenvolvimento do Noroeste do Brasil (Brasília, 1979).

survey of the Northwest. The purpose of this survey was to expand the Bank's general knowledge of the region, to assess in detail the region's development potential and to identify issues that might bear on the Bank's decision as to whether it should eventually help finance POLONOROESTE. The survey, which took about a year to complete, has been published recently by the World Bank. 3/

Prior to the initiation of the survey, the World Bank's knowledge of the Northwest was quite limited. Some staff members had visited the region and there was a general impression that it had good agricultural potential and that the emerging pattern of land ownership was considerably more equitable than most other parts of Amazonia. Both of these characteristics added to the Bank's interest in participating in a possible development program for the Northwest. However, there was a need for a broader, in-depth analysis of the region's socioeconomic situation. To this end, it was decided that the following topics would be analyzed: ongoing development planning for the Northwest; population, migration and social indicators; Amerindians; environmental issues; land settlement; agriculture; industry and transportation. The findings with respect to some of these subject areas are summarized in the following paragraphs.

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3/ World Bank, Brazil: Integrated Development of the Northwest Frontier (Washington, D. C., June 1981).

Demographic Factors

One of the more important tasks of the World Bank survey team was to investigate and quantify, to the extent possible, the nature and extent of recent migration to the Northwest. Soon after arriving in the field, it became apparent that the reports of a mass migration to the region were indeed true. Census and other supporting data indicated that the region's population had grown by almost 11% per year during 1970-80, rising to almost 16% in the case of Rondonia. <sup>4/</sup> These rates were far higher than could be explained by natural growth alone and it was estimated that upwards of a half million migrants had entered the region during the decade. Though refinements in migration estimates will only be possible after the publication of the full 1980 Demographic Census, it would appear that at least 50% of all migrants to the Brazilian Amazon during 1970-80 had the Northwest as their destination.

Several other characteristics of the recent migratory flow to the Northwest are also of importance. First, in contrast to the migration of the early 1970s to the area of the Trans-Amazon Highway, virtually all of the migration to the Northwest has been spontaneous. Although further research is needed to determine the causes of this spontaneous flow, preliminary studies suggest that the "pull" of fertile land in the Northwest has been reinforced by strong "push" factors in the regions of origin of

<sup>4/</sup> In absolute terms, the region's population grew from 375,000 to about one million over the decade.

the migrants. Among the more plausible of these "push" factors are: (i) agricultural mechanization and a consequent decline in rural employment opportunities; (ii) excessive fragmentation of landholdings through inheritance in regions of earlier small-farmer settlement; (iii) the substitution of agriculture by ranching activities; and (iv) periodic climatic problems such as droughts and frosts.

Second, the available data indicate that most of the migrants to Rondonia during 1970-80 originated in the states of Paraná (30%) and Mato Grosso (30%). Much smaller numbers have come from Minas Gerais, Espírito Santo, São Paulo and the Northeast. This is in contrast to the pre-1970 migration to Rondônia which was dominated by northeasterners. However, survey data tabulated by place of birth suggest that many recent migrants from Paraná and Mato Grosso had lived in at least two places before reaching the Northwest, and had originally started out from Minas Gerais, Espírito Santo and the Northeast.

Finally, the data show the average migrant to be young, male and from an agricultural background. About 46% of the population in INCRA settlement projects is under 15 years of age and a high (90% in 1977), but declining (50% in 1979), percentage of the population give their occupation as farmers. Additional data on education and health status indicate that most migrants are poorly equipped on both counts. INCRA data show that over 50% of the family heads in official colonization projects are illiterate and that the infant mortality rate in Rondônia (in 1978, 137 per 1,000 live



births) is 40-50% higher than the national average. Malaria is the chief health problem of the region, and rates of incidence exceeding 50% are not uncommon in some areas.

From the analysis of demographic trends, it was quickly concluded that an expansion of government activity in the region was urgently needed. Upwards of one million people were already in the region and more were entering at the rate of some 5,000 per month. Although the spontaneous nature of the migratory flow was viewed by the survey team as a positive factor (the assumption being that spontaneous migrants are generally more motivated, and hence more likely to become successful homesteaders, than those recruited by the government as in the Trans-Amazon Highway case), its dimension was considered well beyond what INCRA, at the time, was capable of accommodating. The finding that a major proportion of the migrants originated in areas with natural environments far different from that of the Northwest had at least two important implications. First, it suggested that agricultural extension services would need to be strengthened considerably in order to retard the implantation of imported, ecologically-inappropriate land-use systems. Second, it implied that the new migrants would arrive in the region with little or no resistance to certain tropical diseases, particularly malaria. Finally, the age structure of the migrants was significant in that it implied a high dependency ratio and a consequent strong potential demand for social services like health and education.

Environmental Issues

An analysis of the natural environment of the Northwest was another high priority task of the survey team. After all, environmental factors are the principal determinants of the success or failure of any agricultural development scheme. However, in this area, the World Bank team (and the government planners as well) was at a great disadvantage. Detailed soil and land use surveys were simply not available and the survey team was obliged to rely mainly upon soil maps prepared in 1975 by the Brazilian Agricultural Research Enterprise (EMBRAPA) at a scale of 1:5 million and those prepared in 1978 by "Projeto RADAM" at a scale of 1:1 million. Though these sources indicated about 29,000 km<sup>2</sup> (or 7.1% region's total land area) of relatively fertile soils (dominantly eutrophic podsols), the large scale of the maps, coupled with the extreme heterogeneity over short distances of the region's soils, greatly reduced the usefulness of this finding with respect to the appropriate siting of proposed new settlement projects.

Another finding in the environmental area was that the intense migration to the Northwest was leading to accelerated deforestation. While it was estimated that less than 5% of the region's total land area had been cleared, Landsat data showed that the deforested area of Rondônia had increased from 121,000 to 297,000 hectares between 1975 and 1978. Some of this deforestation was considered to be an inevitable consequence of new settlement and agricultural development. However, the World Bank team observed that in various parts of the Northwest land with little or no agricultural potential was being cleared, in many cases solely for purposes

of establishing a legal claim. In order to minimize such wasteful uses of the forest, it was recommended that comprehensive land-use zoning be developed for the region (including the establishment of new national parks and forest reserves), that ecological research be intensified and that existing environmental legislation be more rigorously enforced.

#### The Amerindian Question

Without doubt, the most difficult and sensitive topic to be addressed by the survey team was the Amerindian question. It did not start out that way. Before arriving in the field, the consensus of the team was that possible clashes between new settlers and the indigenous population could be a potential issue, but no special priority was given to studying the problem. This consensus, however, was based on a very limited knowledge of the Northwest's Amerindians and their particular needs. Once in the field, the survey team's initial naivité quickly gave way to realism.

To begin with, it was found that the region's indigenous population was much larger and more diverse than previously thought. Although estimates still differ, the survey mission came up with a total Amerindian population of around 8,000. Of this total, about 4,300 Indians are located in official areas, that is, interdicted, delimited or

demarcated tracts. <sup>5/</sup> These Indians occupy an area totalling about 5.3 million hectares, of which only about 1.3 million hectares (30% of the total) have been formally demarcated. In addition, it was found that the Amerindian population is comprised of over 20 tribal groups, with considerable variation in such factors as population size, language, religious beliefs and the extent of acculturation in evidence.

It was also found that the expansion of the agricultural and mining frontiers into the Northwest had already had some negative effects on the indigenous population. Among the more common of these effects were the transmission from whites to Indians of diseases such as tuberculosis, measles and smallpox, and inadvertent or intentional invasions of Indian lands by migrants or enterprises. Particularly serious problems of this nature were observed in the Sete de Setembro reserve in Rondônia and in the Guaporé Valley of Mato Grosso. In the first area, the main issue was the presence of approximately 90 families illegally occupying lands of the Surui tribe. In the second, it was found that the lands of Indian groups collectively known as the Nambikwara (numbering about 600 persons) had been seriously encroached upon by corporate cattle ranches which, with the aid of government fiscal incentives, had established themselves in the Guaporé

<sup>5/</sup> "Interdiction" is the first step in the process to define legally Indian land rights. It is an administrative procedure through which entry to an area believed inhabited by Indians is prohibited to all but FUNAI staff. Once the traditional territory of an Indian group is determined, its boundaries are "delimited" on a map, and legal rights to the land are transferred to the tribe. The final step in this process is to "demarcate" the land at the ground level by clearing a six-meter swath around the boundaries, and placing concrete posts at 1,000-meter intervals.

Valley during the 1960s and 70s. By the time of the survey, the Nambikwara had been concentrated in six small reserves totalling less than 200,000 hectares (of which less than 60,000 hectares had been effectively demarcated) and were facing the prospects of a new road (a "variant" of BR-364) that would cut through their homeland.

On the basis of its field observations, the survey team concluded that the implementation of a major development program for the Northwest, by encouraging an even larger migratory flow, could significantly increase the threat to the Indians' health and to the integrity of their lands. It was therefore recommended by the team that the proposed development program contain an "Indian component", emphasizing the demarcation of tribal lands and the upgrading of medical services (especially vaccinations) available to the indigenous population. This recommendation was received by the government with some surprise and consternation. The World Bank (and to our knowledge no other public international lending institution) had never raised the Indian issue before in an operational sense, and the government was unsure of the implications of extensive foreign involvement in this sensitive area. With the passage of time, however, this initial uncertainty faded. In 1980, FUNAI (National Indian Foundation), in collaboration with World Bank staff, completed preliminary work on a plan to expand its activities in the proposed program area. 6/

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6/ Fundação Nacional do Índio (FUNAI), Projeto de Apoio as Comunidades Indígenas da Área de Influência da Rodovia Cuiabá/Porto Velho (Brasília, 1980).

Land Settlement and Agriculture

The survey team's investigation of existing land settlement schemes in Rondonia revealed a number of issues, most related to the gap between the new migrants' demand for land and INCRA's capability to satisfy this demand. One reflection of this gap was the many prospective settlers who were observed claiming squatters' rights to land in isolated areas far removed from the main Cuiabá-Porto Velho road. Others, while awaiting their own plots of land, were found to be engaged in wage labor in the burgeoning towns along BR-364, or on the farms of established settlers. However, even those settlers admitted to official colonization projects were experiencing difficulties evacuating their surplus agricultural production (especially during the rainy season) for lack of adequate farm access roads. On-farm crop losses were estimated as high as 50%. Because of poor roads, settlers were also frequently denied de facto access to rural credit, extension services, storage and marketing facilities and social services.

Another important issue noted by the survey team was the region's confused land tenure situation and the apparent inability of INCRA to provide quickly land titles to the new migrants. As elsewhere in Amazonia, the lack of definitive titles is a constant source of conflict in the Northwest and an important constraint to the rational expansion of agriculture. Settlers without titles are normally reluctant to make on-farm investments and are at a disadvantage when seeking rural credit from official sources. Traditional shifting cultivation and other wasteful forms of land use are thus encouraged.

The survey team found great uncertainties with respect to land tenure in both Rondonia and Mato Grosso, but especially in the latter. Before 1979, the process of issuing titles in Rondônia had been slow and uneven, reflecting INCRA's staff shortages, difficulty of access to farms and the complex bureaucratic demands placed upon the farmers themselves. Over the 1979-81 period, however, the situation improved considerably owing to an expansion of INCRA's staff assigned to titling and to a streamlining of bureaucratic procedures. Progress has been much slower in Mato Grosso. INCRA has not yet established official settlement projects in Mato Grosso, and the resulting structure of land ownership is much more concentrated than in Rondônia. <sup>7/</sup> Furthermore, there are persistent reports that the existence of several titles to the same parcel of land is commonplace.

A final issue concerns the appropriate choice of crops and farming systems. The survey team found the dominant system in the Northwest to be highly traditional. That is, the forest or cerrado is cleared, the timber of a few valuable species is extracted and the remaining debris is burned. This sequence is usually followed by a single upland rice crop, while new clearing is undertaken in preparation for the next crop year. Though in recent years tree crops such as cocoa, coffee and rubber have been introduced to the region, some irreparable ecological damage has resulted from the practice of shifting cultivation. The possibility of further such damage through the practice of ecologically-unsound agriculture by new settlers was considered high.

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<sup>7/</sup> Properties over 1,000 hectares account for 85% of the total farm area in Mato Grosso, versus about 33% in Rondônia.

The survey team recommended that various measures be taken to help resolve the outstanding issues related to land settlement and agriculture. In order to deal with the access problem, the team recommended the construction of new farm-to-market roads and the expansion of production-oriented and social infrastructure to the more remote areas. It was also recommended that land regularization and land titling services be improved, especially in Mato Grosso. With respect to farming systems, the team advised that future development be based overwhelmingly on tree crops and forestry so as to minimize long-term ecological damage. To this end, it was suggested that detailed land capability surveys (at scales ranging from 1:25,000 to 1:100,000) be carried out in all areas proposed for new settlement projects, before means of overland access to these areas became available.

#### The POLONOROESTE Projects

POLONOROESTE was officially established on May 27, 1981 through Decree 86,029. It is administered by SUDECO (Superintendency for the Development of the Center-West Region), and is budgeted at approximately \$1.5 billion for the 1981-85 period. POLONOROESTE provides for the reconstruction and paving of the Cuiabá-Porto Velho road; an expansion of the region's feeder roads network; the consolidation of existing settlement



projects and the establishment of new ones; the execution of land regularization services; support to productive activities (e.g., agricultural research, technical assistance and rural extension, credit, storage and marketing) and the expansion of social services (education and health); the improvement of infrastructure available to small rural communities; the delimitation and demarcation of national parks and forest reserves and the construction of ecological research stations; and the expansion of social services in Amerindian communities and the demarcation of Indian lands. Among the quantitative targets of the program are: settlement of at least 30,000 families (22,000 in Rondônia and 8,000 in Mato Grosso) in new areas; regularization of the land tenure situations of some 3,900 families; and in the older settlement areas of Rondônia and Mato Grosso, provision of extension services to 85,000 farmers (of which 20,000 would be non-owners), construction of 44 storage facilities and expansion of the primary school system to accommodate 174,000 new students.

Owing to the large number of components and the difficulty of preparing each at the same pace, it was decided that the World Bank would help finance POLONOROESTE in phases. As with all projects assisted by the Bank, this decision was reached on the basis of detailed technical appraisals of both the program as a whole and its individual components. As noted previously, three loans in support of the first phase of the program were approved in December 1981. These loans are in support of a highway project (\$240 million), an agricultural development and environmental

protection project (\$67 million) and a health project (\$13 million). Two second-phase loans are now under consideration: a \$26 million loan for integrated rural development in Mato Grosso and a \$50-100 million loan in support of new settlement projects in both Rondônia and Mato Grosso. Details of the first-phase projects, and how they were designed to deal with some of the region's more important development problems, are given below.

#### The Highway Project

The basic objective of this project is to ease the development constraint posed by difficulties of physical access. An additional objective is the strengthening of local institutions, particularly the Rondônia Roads Department. The most important, and costly, aspect of this project involves the paving of about 1,084 kilometers of the Cuiabá-Porto Velho road between Corrego Campinas (Mato Grosso) and Ariquemes (Rondônia). This measure is expected to greatly facilitate access to the Northwest, especially during the rainy season, and to significantly lower transport costs. This latter effect should reduce the FOB prices of most goods (including farm inputs) imported from other regions and improve the competitiveness of the Northwest's exports. As a complement to the paving of BR-364, about 2,880 kilometers of feeder roads and 5,400 kilometers of farm-to-market municipal access roads are to be constructed or improved.

### The Agricultural Development and Environmental Protection Project

The objectives of this project are to expand agricultural and social infrastructure and services in the existing INCRA settlement projects of Rondonia, and to help minimize the negative effects on the natural environment of future regional development. With respect to the first objective, the project gives priority to some 18,000 recent settlers (both owners and non-owners) located on the outer fringes of the settlement projects. Owing to the concentration of infrastructure and services in areas closest to BR-364, these are the settlers who are most apt to be denied de facto access to rural credit, extension services, schools and hospitals, etc..

The principal means by which infrastructure and services would be brought to these more isolated settlers are the Rural Service Centers (NUARs). Such centers, originally conceived by the Rondônia Agricultural Secretariat, would each occupy an area of about 40 hectares. They would be sited at the intersection of two existing or proposed roads and would contain administrative, service, recreational and commercial areas in addition to 200 lots for private homes. Thirty-nine NUARs are to be financed under the project. The Rural Service Centers are expected to emerge as the focal points of community development in Rondônia and, as such, to form the basis of the territory's future towns and cities.

Other measures contemplated under the project are essentially directed to facilitating the development of the second-phase projects. To this end, the project would help finance land regularization services in

Mato Grosso as well as soil surveys for future settlement areas in both Rondônia and Mato Grosso. The land regularization component would seek to strengthen the basis of future agricultural development by helping to alleviate one of the region's most important problems -- uncertainty over land ownership. It would sort out the claims to some 5.3 hectares of land, and demarcate and title an estimated 600,000 hectares belonging to small-scale producers (with less than 100 hectares). The soil survey component would be aimed at improving the information base for rational land use planning. Through the execution of detailed surveys (at a 1:50,000 scale) on some 170,000 hectares tentatively selected for the sites of new settlement projects, it is expected that data will be generated which will better enable INCRA to guide prospective settlers to areas with the highest agricultural potentials.

A number of measures, in addition to those described above, are concerned with protecting the region's natural environment. Included among these are: steps to establish comprehensive land-use zoning for the region; the strengthening of IBDF's (National Forestry Development Institute) capacity for monitoring and controlling deforestation; the establishment and protection of a national park and two biological reserves; the establishment or expansion of four SEMA (Special Secretariat for the Environment) ecological stations; and the sponsoring of basic ecological research. Furthermore, the extension services provided to settlers would be oriented more towards the promotion of ecologically-appropriate perennial crops and forest-related activities, or combinations of the two.

### The Health Project

This project is directed to alleviating two health problems often associated with tropical frontier development -- lack of access to health care (especially primary) facilities, and inadequate malaria treatment and control. In the first instance, the project would finance the establishment of one health center in each of the 39 NUARs. These centers, to be staffed by two or three auxiliary personnel, plus a part-time physician, would provide both preventive and curative care to some 360,000 rural beneficiaries. In order to better serve the population in areas more distant from the NUARs, 50 health posts are also to be equipped and staffed. The actual construction of the health posts would be carried out on the basis of community self-help arrangements (mutirão), with the beneficiaries supplying both labor and materials. Finally, the project would finance the establishment of three referral health centers to treat those cases considered too serious to be handled at the health center or health post levels. The referral centers are to be staffed by full-time physicians and paramedics, and supplied with appropriate laboratory and surgical equipment.

With respect to malaria control, the project would be mainly directed to expanding SUCAM's (Superintendency for Public Health Campaigns) ongoing activities in Rondônia, perhaps the major focus of this disease in

Brazil. 8/ To this end, the project would help finance equipment, vehicles, staff salaries, consultants services, DDT and anti-malaria drugs. As a result of this intensified malaria control program, SUCAM expects the average incidence of this disease to fall from 108 per 1,000 to 30 per 1,000 by 1986. To complement the malaria control program, basic research on tropical diseases would also be financed under the project. Though it is expected that the research component will emphasize topics pertaining to malaria, aspects of other tropical diseases, such as leishmaniasis and schistosomiasis, are also likely to be studied.

#### Protection of Amerindian Interests

Though not directly financed by the World Bank, a package of measures aimed at minimizing the possible negative effects of new settlement and development on the Amerindian population of the Northwest has been included as an integral part of POLONOROESTE. 9/ The specific measures are similar to those first proposed in the previously-mentioned FUNAI plan, although they have been revised somewhat as a result of subsequent study and discussion. The package, as presently construed, calls for the execution of

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8/ It has been estimated that, during 1980, at least one member of every family in Rondonia contracted malaria.

9/ In addition to this package, DNER (National Highways Department) has contractually obliged all road construction companies involved with POLONOROESTE to: inoculate members of construction teams and to restrict their movements outside of construction areas, assist Indians in cases of emergencies and to notify FUNAI immediately if any Indians appear at construction camps.

various actions relating to land regularization and demarcation, health, administration, education, economic development and monitoring and evaluation.

Probably the most urgent of these actions are those pertaining to land and health. With respect to land, the FUNAI project calls for the demarcation of some 3,900 kilometers of reserve perimeters by the end of 1982. Though this quantitative target may be altered as the boundaries of Indian areas in the Northwest become more precisely defined, the basic objective is to demarcate the lands of all Amerindian groups whose traditional territory has been determined. This would exclude, for example, the lands of as yet uncontacted tribes, as well as those of recently-contacted groups like the uru-eu-wau-wau of Rondônia.

The health component of the FUNAI project is aimed at expanding present services to cover the region's entire Amerindian population. The priorities in this area, established by FUNAI, include: immunization; measures to improve FUNAI's capability to respond to epidemics; control of tuberculosis and malaria; maintenance of adequate supplies of medicines in local posts; and, perhaps most importantly, intensified training to improve the effectiveness of post chiefs and Indian health monitors. These priority needs are to be addressed by , inter alia, improving existing mobile health units, the provision of more intensive health care through arrangements with a hospital in Vilhena; the upgrading of the FUNAI clinic in Cuiabá; and the establishment of special health training seminars.

Although the Amerindian protection project is admittedly ambitious, some positive steps have already been taken by FUNAI. First, all squatter families have now been removed from the Sete de Setembro Reserve. INCRA has resettled these families elsewhere, and provided them with titles. This measure should reduce social tensions in central Rondônia, and allow the Suruis greater freedom to become acculturated at a pace of their own choosing.

Second, the land available to the Nambikwara of the Guaporé Valley has been significantly expanded. In this regard, a new 243,000-hectare reserve, called the "Guaporé Valley Indian Area", was established by FUNAI in October 1981 for the Hahaintesu, Waiksu/Alakatesu, Wasusu, Negarote and Mamainde groups. It extends almost the entire length of the Valley, including the sacred Indian burial grounds located on the escarpment of the Chapada dos Parecis, and joins four small reserves established previously. Additional steps taken recently include the creation of a new 30,000-hectare reserve, named the "Pirineus de Souza Indian Area", at the north end of the Valley for the Idalmare, Sabanê and Tauandê groups of the Nambikwara; and the formal delimitation of the boundaries of the 68,000-hectare Sararé Reserve to the south. Through these combined actions, lands officially reserved for the Nambikwara in the Guaporé Valley have increased by almost 75% -- from 198,000 to some 350,000 hectares. It is expected that these lands will be effectively demarcated during 1982; the construction of new health facilities and the contracting and training of health-related personnel have already begun.



### Conclusions

Several conclusions follow from the World Bank's experience with POLONOROESTE. First, and foremost, experience to date has shown that collaborative efforts in the Amazon Region between the Brazilian government and public international lending institutions can be mutually beneficial. To the Brazilians, the availability of external resources for a priority development program has certainly been a benefit. But so too have the objective critiques of the program and the intensive technical assistance provided by World Bank and FAO staff.

To the Bank, the benefits have been more indirect, but no less real. During the course of providing technical assistance, Bank staff members have learned much from their own observations and from those of their Brazilian counterparts about the challenges of, and approaches to, tropical frontier development. Such knowledge will undoubtedly have important implications for future World Bank operations both in Brazil and in other countries with tropical frontiers. In fact, partially as a result of the POLONOROESTE experience, the World Bank has recently released a statement on the impact of economic development on tribal peoples. <sup>10/</sup> Formal project preparation guidelines on this topic are presently being reviewed.

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<sup>10/</sup> World Bank, Economic Development and Tribal Peoples: Human Ecologic Considerations (Washington, D. C., July 1981).

A second, related, conclusion is that the elaboration of practical approaches aimed at resolving some of the principal problems of frontier expansion in Amazonia, while difficult, is not impossible. Though this may seem self-evident, it is a conclusion seldom reached in much of the recent literature on Amazonian development. With some notable exceptions, the literature of the past few years has tended to concentrate on documenting some of the more negative aspects of recent frontier expansion in Brazil (such as outbreaks of violence over land issues, the dispossession of subsistence producers by large corporations, Indian deaths through disease and hunger, misguided development planning, etc.) while making few recommendations on how these problems might be avoided in the future. It may be argued that such literature has performed a valuable function by directing both Brazilian and international attention to certain issues, but surely the time has come to tip the balance more in favor of research dealing with possible solutions to these issues.

Finally, a word about risks. Although POLONOROESTE has been designed to deal with a good many of the issues related to current and prospective developments in the Northwest, it would be foolhardy to assume that all will go smoothly during the program's implementation. The settlement of a remote frontier area is probably impossible to control entirely, and continuing uncertainties about the resource base and appropriate land-use systems add further elements of risk. Thus, in the Northwest, and in Amazonia in general, the government should be prepared to accept some of the negative consequences of accelerated frontier development. The hope is that these consequences will be far less severe than they would have been had POLONOROESTE never been established.