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Managing the Environmental and Social Impacts of Major Road Investments in Frontier Regions: Lessons from the Inter-American Development Bank's Experience

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This Technical Note was prepared by the Environmental and Social Safeguards Unit (VPS/ESG) of the Inter-American Development Bank (IDB). ESG works to promote the environmental and social sustainability of Bank operations. It collaborates with project teams to execute the IDB's commitment of ensuring that each project is assessed, approved and monitored with due regard to environmental, social, health and safety aspects, and that all project – related impacts and risks are adequately mitigated or controlled. ESG also helps the Bank respond to emerging sustainability issues and opportunities.

This manuscript documents and summarizes the principal lessons from a sample of major road improvement (and road-related) projects in ecologically sensitive and socio-culturally diverse natural resource rich "frontier" regions in Central and South America, based on case studies of completed and ongoing Bank operations in five countries – Bolivia, Brazil, Colombia, Panama, and Peru.

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Contents

Acronyms

AACD	Competent Departmental Environmental Authority
ABC	Bolivian Road Administration
ABT	Forest and Land Inspection and Social Control Authority
ANAM	National Environmental Agency
BIC	Bank Information Center
CAF	Andean Development Corporation
CCLIP	Conditional Credit Line for Investment Projects
CEADESC	Center of Applied Studies on Economic, Social, and Cultural Rights
CI	Conservation International
CONADES	*Consejo Nacional para el Desarrollo Sostenible*
COSIPLAN	Council for Infrastructure and Planning
CVAN	*Amazonas Norte* Road Corridor
DMI	Integrated Management District
EC	European Commission
EEZ	Economic-Ecological Zoning
EIA	Environmental Impact Assessment
EIA-RIMA	Environmental Impact Assessment and Associated Environmental Impact Report
ESG	Environment and Safeguards Group
ESIR	Environmental and Social Impact Report
ESMP	Environmental and Social Management Plan
ESMR	Environment and Social Management Report
FOE	Special Operations Funds
Fonplata	Plate River Basin Financial Development Fund
GHG	Greenhouse Gas
GP	Guarantee Proposal
ICIM	Independent Consultation and Inspection Mechanism

ICR	Italian Trust Fund for International Competitiveness
IDB	Inter-American Development Bank
IIRSA	Regional Infrastructure Integration Initiative for South America
IMAC	Acre Environmental Institute
INRA	National Institute of Agrarian Reform
INRENA	National Institute of Natural Resources
INVIAS	National Highway Institute
LP	Loan Proposal
MAVDT	Ministry of Environment, Housing and Territorial Development
MDA/DNA	National Direction of Archaeology, of the Ministry of Economic Development
MFI	Multi-lateral Financial Institution
MIF	Multi-lateral Investment Fund
MSDP	Ministry of Sustainable Development and Planning
MTC	Ministry of Transportation and Communication
NEDC/UNAR	National Unit of Archaeology, of the Ministry of Education, Culture and Sports
OPEC	Organization of Petroleum Exporting Countries
PAC	Growth Acceleration Program
PAD	Definitive Action Plan
PASA	Environmental Applications and Management Plan
PCR	Project Completion Report
PDSCZ	Prefecture of the Department of Santa Cruz
PDSD	*Programa de Desarrollo Sostenible de Darién*
PMACI	*Proteção do Meio Ambiente e das Comunidades Indígenas*
PMASIS	The Integrated and Sustainable Environmental and Social Management Plan
PPM	Prevention and Mitigation Plan
PPP	Public-Private Partnership
REA	Regional Environmental Assessment

RFPCARM	Protected Forest Reserve of the Upper Mocoa River Basin
RFPPRM	Mocoa River Protected-Productive Forest Reserve
RIMA	Associated Environmental Impact Report
RND	Agriculture and Natural Resources (operational division of the Bank)
SEA	Strategic Environmental Assessment
S-EMP	Socio-environmental Management Plan
SEPLAN	Secretariat for Planning and Economic Development
SEPSA	Strategic Environmental, Poverty and Social Assessment
SERNAP	National Protected Area Service
SESA	Strategic Environmental & Social Assessment
SIF	Forestry Superintendency
SNC	National Road Service
SSA	Socio-environmental Supervision
STD	Transport (operational division of the Bank)
TC	Technical Cooperation
UEP	Project Executing Unit
UGAI	Management Units
UNASUR	Union of South American Nations

Executive Summary

The Inter-American Development Bank (IDB) has gained considerable experience over the past several decades with the design and implementation of major road improvement projects in ecologically sensitive and socio-culturally diverse natural resource rich "frontier" regions in Central and South America. Such projects include the construction of new roads and the pavement and upgrading of existing unpaved highways, a number of which were previously largely impassable during extensive annual rainy seasons. Much has been learned from these projects both with respect to the scope and nature of their direct and indirect environmental and social, as well as economic, impacts and how these impacts can best be managed. The present paper summarizes the principal lessons from a sample of such projects to date, based on case studies of Bank operations that have either been completed or are currently at various stages of implementation in five countries – Bolivia, Brazil, Colombia, Panama, and Peru – and which have been supported by a variety of Bank instruments. In doing so, it organizes the discussion around the main parts of the project cycle, from preparation and design and up-front environmental and social assessment and management planning, to project implementation and results, and Bank supervision, monitoring, reporting and ex-post evaluation.

Frontier areas in the Latin American context are initially sparsely inhabited, often humid tropical regions characterized by the presence of rich natural resources, both renewable --such as forests, soils, water, and biodiversity -- and frequently also non-renewable ones, such as minerals and hydrocarbons. They are generally located at a considerable distance from national capitals and other major cities and, prior to the road improvement projects considered in this review, have relatively poor access and connectivity over land to and from the more populated parts of the countries in question. Their resident populations are generally poor and often composed in part of indigenous communities and/or other traditional groups, such as rubber tappers in the Brazilian Amazon and small subsistence farmers there and elsewhere.

Major road improvement projects in frontier areas, including those financed by the Bank, have a number of objectives (and/or intended benefits), many of which are ultimately interrelated. The most common and immediate objective is to significantly reduce transportation costs both in terms of decreasing travel times and of reducing vehicle wear and tear -- and, thus, operation and maintenance costs – as the result of new and/or paved roads. A second important objective is to improve international or intraregional integration that is expected to lead to greater

international trade and associated national economic growth. A third key objective, although in some cases (i.e., in those road projects whose main objective is to strengthen international integration) this is more implicit than explicit, is to promote local and regional economic and social development in the frontier areas themselves.

Successful road investments in frontier regions, in practice, often do have – or at least substantially contribute to -- the intended economic and social benefits mentioned above. In addition, however, they generally also have significant environmental and social impacts. These impacts can be both direct and indirect; with the latter including the impacts of induced local and regional development brought about as a result of the reduced transport costs and increased access to rural land and other natural resources. Particularly in such regions, the environmental and social, as well as economic, impacts of major highway improvements are also likely to interact with those of other investments, both for other types of infrastructure, including energy, ports, and secondary or feeder roads, and new and/or expanded productive activities. These cumulative environmental and social impacts likewise need to be taken into account and managed in connection with the major trunk road improvements themselves.

Among the many useful lessons that can be learned from the environmental and social assessment and management experience of major completed and ongoing IDB-supported road improvement and related investments in South and Central America are the following:

1. Especially in frontier regions, the indirect environmental and social effects of major road improvements may frequently be much greater and more widespread than their direct ones. This is the case because one of the main purposes of such investments is to improve access and reduce transportation costs to and from formerly remote areas, thereby opening them up for new settlement and/or the increased exploitation of their natural resources, both renewable, such as forests and soils, and non-renewable, such as minerals and hydrocarbons.
2. Given that one of the main purposes of rural road improvements in frontier areas is to induce further local development, which may have significant environmental and social, as well as economic, impacts, it is also necessary to consider the potential effects of these investments together with those of closely associated development interventions.

3. Before undertaking a major road improvement in such areas, it is important to first identify and understand, as fully as possible, both their existing ecological and socio-cultural conditions and current population and productive occupation trends and to project, as adequately as possible -- with establishment of an ongoing monitoring program to determine how the situation actually evolves in this regard -- what is likely to happen in demographic, economic, social and environmental terms once access is improved and transportation costs significantly reduced. This also means the need to understand – and monitor -- the local political economy and governance conditions in frontier areas to the extent possible and how they are likely to evolve in response to any proposed major transport improvements, especially as these areas tend to have very different governance characteristics and trajectories than older and more settled regions given the frequent predominance of illegal, as well as uncontrolled, productive activities and, more generally, their "wild west" nature, with their associated particular social and institutional characteristics.
4. Taking a sustainable development approach to the direct and indirect area of influence of a major rural road improvement project in a natural resource rich frontier region, especially in areas subject to the risk of significant deforestation, ecosystem destruction, and loss of biodiversity, will necessarily involve controlling future land use in this area, among other precautions, particularly in zones in relatively close proximity to the trunk road itself and/or to any secondary roads that branch off from it.
5. This will require both increased knowledge of and control over the land tenure situation and an ability to closely monitor and limit any forest conversion to other uses that does take place, through environmental licensing, remote sensing, ground truthing, and other means. Creating and/or strengthening official protected areas -- including indigenous peoples' reserves, where applicable – are also an important part of this process.
6. In this connection, major road upgrading projects in natural resource rich frontier regions should not only seek to "avoid harm" to the environment and to indigenous and other vulnerable local communities in their areas of influence, but also proactively seek to "do good" by containing measures to directly strengthen and enhance these ecosystems and benefit, as well as protect, populations. Thus, they should be designed and utilized to the extent possible as broader local development undertakings, not only in terms of

improving access and reducing transport costs -- and, thus, indirectly stimulating new and/or enhanced local productive activities, important as these are, especially in remote regions -- but also seek to identify and promote socio-economic and other opportunities to enhance the income, employment and living conditions of resident populations, especially the poorest. This also clearly points to the need for any such interventions to be as participatory as possible.

7. Finally, while the consistent and effective application of Bank environmental and social safeguards are important in such situations, strong, consistent and demonstrated local political will and support are even more essential for such initiatives to be successful.

In summary, whether their primary objective is to stimulate local development or to strengthen interregional territorial and economic integration, major interurban and rural road improvements, especially in natural resource rich frontier regions, are likely to have significant direct, indirect -- including induced development -- and cumulative environmental and social impacts. These need to be properly and clearly identified, anticipated, and adequately addressed. While each case will have distinct needs and requirements depending on the particular geographic, ecological, economic, socio-cultural, and political-institutional context involved, it is essential that these contexts be properly understood through a sufficiently comprehensive up-front environmental and social assessment and subsequent participatory environmental and social management and monitoring process. In this regard, project design and preparation will benefit from the effective use of Strategic Environmental Assessments (SEAs) that should also focus on a broader set of development initiatives in the same direct and indirect area of influence as that of the major road improvement in question. Such assessments should also contemplate potential project impacts that cross national borders, as appropriate.

In addition, a more holistic or comprehensive spatial – rather than sector by sector -- approach to sustainable development around the physical and economic corridor polarized by the road segment to be improved is recommended. Building on its successful experience to date, the IDB should not only approach road improvement projects in areas having similar characteristics elsewhere in Latin America in the same comprehensive, creative and proactive fashion, but it also has an excellent opportunity to lead the way with regard to the promotion of environmental quality and socio-cultural protection objectives at the subnational level through the systematic

and coordinated implementation of a broader set of sustainable development interventions together with such road investments.

Lastly, it is important not to forget that, while good up-front SEAs, corresponding environmental and social management plans, and appropriate project preparation design are essential, at the end of the day, what matters most is what actually happens – or does not happen -- on the ground. Thus, project implementation and proper and well-coordinated Bank monitoring and supervision, with an eye toward adaptive management, including in response to unanticipated events and/or project impacts, is likewise very important. Good reporting, both during and after project preparation and implementation, is likewise important, as is detailed and systematic ex-post evaluation, in which environmental and social aspects and impacts should receive explicit attention together with other project components and outcomes, especially in large lending operations for road and/or other infrastructure improvements in complex and dynamic natural resource frontier settings such as those considered in the present review.

A. Introduction

Over the past two and a half decades, the IDB has gained considerable experience with the design and implementation of major road improvement (and road-related) projects in ecologically sensitive and socio-culturally diverse natural resource rich "frontier" regions in Central and South America. Such projects include the construction of new roads and the pavement and upgrading of existing unpaved highways, a number of which were previously largely impassable during extensive annual rainy seasons. Much has been learned from these projects both with respect to the scope and nature of their direct and indirect environmental and social, as well as economic, impacts and how these impacts can best be managed. The present paper will summarize the principal lessons from a sample of such projects to date, based on case studies of Bank operations that have either been completed or are currently at various stages of implementation in five countries – Bolivia, Brazil, Colombia, Panama, and Peru[1] – and which have been supported by a variety of instruments, including Technical Cooperation (TC), loans,

[1] A separate case study of a major IDB-financed road project in the Chaco region of Paraguay was undertaken by another consultant. See Philip Hazelton, *El Chaco Paraguayo: El Impacto de Proyectos Viales y Visiones de Desarrollo da la Región*, consultant's report for the Inter-American Development Bank, June 2011. Due to significant differences in methodology, however, it will not be further considered in the present overview paper.

grants, and, in one case, a partial credit risk guarantee. In doing so, it will organize the discussion around the main parts of the project cycle, from preparation and design and up-front environmental and social assessment and management planning, to project implementation and results, and Bank supervision, monitoring, reporting and ex-post evaluation. A complete list of the operations considered (in chronological order by approval date) in the country case studies is presented in the annex. The paper begins, however, with a brief discussion of the generic objectives and impacts of such investments.

B. Major Road Improvements in Frontier Areas: Principal Objectives

First, it is useful to better define what is meant by "frontier" areas for purposes of this paper. Essentially, in the Latin American context, these are initially sparsely inhabited, often humid tropical regions characterized by the presence of rich natural resources, both renewable -- such as forests, soils, water, and biodiversity -- and frequently also non-renewable ones, such as minerals and hydrocarbons. They are generally located at a considerable distance from national capitals and other major cities and, prior to the road improvement projects to be considered in this review, have relatively poor access and connectivity over land to and from the more populated parts of the countries in question. Their resident populations are generally poor and often composed in part of indigenous communities and/or other traditional groups, such as rubber tappers in the Brazilian Amazon and small subsistence farmers there and elsewhere. While these areas may also be adjacent to national boundaries, they are "frontier" regions primarily in the sense that they are on the edge of existing – but expanding -- areas of denser settlement and more intensive agricultural occupation, which itself is generally a function of distance from and access to major domestic and (through ports) external markets.

Major road improvement projects in frontier areas, including those financed by the Bank, have a number of objectives (and/or intended benefits), many of which are ultimately interrelated. The most common and immediate objective is to significantly reduce transportation costs both in terms of decreasing travel times and of reducing vehicle wear and tear -- and, thus, operation and maintenance costs – as the result of new and/or paved roads. Such roads are generally between one place, already connected to the rest of the country through the existing paved national highway network, and another, further removed and previously unconnected from the existing network by an all-weather surface road. The traditional economic analysis of such

projects normally focuses on a discounted comparison of the estimated (*ex-ante*) and observed (*ex-post*) savings resulting from these reductions in travel and vehicle operation and maintenance costs over time with the estimated and actual investment and maintenance costs associated with their construction or pavement.

A second important objective of several recent Bank-financed or otherwise Bank-supported major road improvement projects in South America is to improve international or intraregional integration, which is expected to lead to greater international trade -- particularly with China and other Asian countries -- and associated national economic growth to the extent that it makes overland transportation for certain (particularly agricultural) commodities (such as soybeans) produced in the eastern half of South America, especially Brazil, both faster and cheaper than shipping them either around Cape Horn to the south or through the Panama Canal to the north. This is particularly the case for the projects that come under the umbrella of the Regional Infrastructure Integration Initiative for South America (IIRSA),[2] more specifically the Interoceanica (or IIRSA Sur) and IIRSA Norte roads in Peru, the Santa Cruz-Puerto Suaréz highway in Bolivia, and the Pasto-Mocoa road in Colombia, all of which are parts of long-term planned single or multi-modal transcontinental transport corridors intended to link major cities and ports on the Atlantic and Pacific coasts.

The Interoceanica highway in Peru has recently been completed and is in full operation, linking up with the national highway system in Brazil, part of which the Bank helped to pave in the late 1980s and 1990s – specifically the portion of the BR-364 highway between the capitals of Porto Velho, Rondônia, and Rio Branco, Acre. The new highway provides the first direct overland transport connection between eastern, central, and northwestern Brazil and the Andean highlands and three ports on the Pacific coast of Peru, passing through extensive parts of the Brazilian and Peruvian Amazon regions. The IIRSA Norte and Pasto-Mocoa roads are someday also expected to connect to Brazil through the Amazon river system, but this will depend on significant navigational improvements along major tributaries of the Amazon River and thus, at least in the case of the Colombian initiative, this will occur sometime much further in the future. The Puerto-Suaréz-Santa Cruz road connects to the city of Corumbá on the edge of the Pantanal

[2] See Inter-American Development Bank, *A New Continent under Construction: A Regional Approach to Strengthen the Infrastructure of South America – Regional Infrastructure Integration Initiative for South America (IIRSA)*, Washington D.C., 2006.

wetlands, the world's largest such region that also includes parts of western Brazil and Paraguay,[3] just inside the border of the state of Mato Grosso do Sul with Bolivia. Corumbá, in turn, is linked by paved road to the rest of Brazil, while Santa Cruz is connected by road to La Paz and the neighboring Andean countries of Chile and Peru, and, thereby to the Pacific coast as well.

A third important objective, although in some cases (i.e., in those road projects whose main objective is to strengthen international integration) this is more implicit than explicit, is to promote local and regional economic and social development in the frontier areas themselves. This, for example, was the initial objective of the Bank's two projects to pave parts of the BR-364 highway between the states of Rondônia and Acre (approved in 1985) and within Acre (approved in 2002) in the Brazilian Amazon region, as well as of the Darién Sustainable Development Project in Panama, which included pavement of a part of the Pan American Highway, among other components (also approved in 2002). In each of these projects, road improvements were expected to help induce an expansion of settlement and natural resource-based productive activities by improving access to and reducing transport costs to, from, and within these regions. In addition, major road improvements in such areas are also expected to improve the access of both existing resident and immigrant populations to social and other public and private services, again by reducing transport times and costs and facilitating the expansion and decentralization of investments in health, education, basic sanitation, and other services and commercial activities, which themselves are often growing quickly in order to serve the rapidly rising regional population.[4]

Thus, major road improvement projects, particularly in frontier areas, are normally expected to generate and induce significant economic and social benefits both for the regions through which they pass as well as for national economies more generally. In all cases, this

[3] For more on this ecologically sensitive extensive multi-country region, see Frederick A. Swarts (editor), *The Pantanal: Understanding and Preserving the World's Largest Wetland*, Paragon House, St. Paul, Minnesota, 2000, especially Part I, "Overview of the Pantanal."

[4] A fourth major objective, which is not explicitly the case in the IDB-supported projects reviewed in this exercise, is **geo-political** – i.e., the improvement of access to and in frontier regions and the associated increase in their occupation in order to secure national frontiers and resources from invasion and exploitation by residents of neighboring or other countries. This was one of the main reasons behind major road building activity in the Brazilian Amazon during the period of the military dictatorship in the 1970s and early 1980s, for example. However, **increased internal security** (in relation to both guerillas and drug traffickers) – or at least improved government access to an area currently characterized by security problems -- does seem to be one of the underlying, but not declared, objectives of the Bank-financed Pasto-Mocoa road improvement project in Colombia.

occurs as the result of the often significant reduction in transportation costs and the associated increased access to relatively undeveloped or unexploited rural land and other natural resources, in some cases, as in Bolivia and Peru, including mineral and/or hydrocarbon, as well as hydropower, soil, forest, and other renewable resources. In short, such investments are essential to further "open up" frontier areas for demographic occupation and economic development, and this is the case, even when their primary purpose is to strengthen cross-border integration among neighboring nations and promote greater international trade and economic growth in other, non-frontier parts of the countries in question.

C. Major Road Improvements in Frontier Areas: Economic, Social and Environmental Impacts

Successful road investments in frontier regions, in practice, often do have – or at least substantially contribute to -- the intended economic and social benefits briefly described above. In addition, however, they generally also have significant environmental and social impacts. These impacts can be both direct and indirect, with the latter including the impacts of induced local and regional development brought about as a result of the reduced transport costs and increased access to rural land and other natural resources mentioned above. Particularly in frontier regions, the environmental and social, as well as economic, impacts of major highway improvements are likely to interact with those of other investments, both for other types of infrastructure, including energy, ports, and secondary or feeder roads, and new and/or expanded productive activities, which are made economically feasible or whose attractiveness is increased as the result of the improved access and lower transport costs the road improvements make possible. These cumulative environmental and social impacts also need to be taken into account and managed in connection with the major trunk road improvements themselves. In some cases, moreover, and especially in the case of highway investments specifically intended to enhance international integration, these impacts will "spill over" from one country to the neighboring one or ones, and, thus, will be transboundary in nature. By inducing greater bi-national traffic flows from east to west, for example, both the now completed Interoceanica highway in southern Peru and the Santa Cruz-Puerto Suárez road in Bolivia are likely to have indirect environmental and social, as well as economic, impacts on the affected parts of neighboring Brazil. Such impacts

must also be properly identified, assessed, monitored and mitigated in the context of such projects.

As will be further discussed below, in identifying and assessing such impacts, it will first be necessary to determine the direct and indirect areas of influence of the road improvement investments in question. And in doing so, it will also be necessary to consider the effects both of the immediate road construction and/or pavement activities and of the longer-term impacts of road "operation." From this perspective, it is likely that the indirect area of influence of a road investment may vary – and, in practice, often expand – territorially over time, especially as new areas are opened up for settlement and productive occupation as the result of the construction of branch and other feeder roads from – and ultimately made possible by -- the main paved highway. This is often illustrated by the "fishbone" pattern of occupation of Rondônia in the Brazilian Amazon in the 1980s and 1990s[5] following pavement of the BR-364 highway between the state capitals of Cuiabá in Mato Grosso and Porto Velho, as part of an ambitious, but ultimately environmentally destructive and socially problematic, regional development program called Polonoroeste, financed by the World Bank.[6]

In addition to opening up frontier regions for new settlement and increased productive occupation by bringing formerly remote rural areas closer to national and international, markets, major road improvement projects also frequently induce significant changes in land use, leading directly to deforestation, forest burning,[7] and loss of biodiversity. They also lead to changes –

[5] For one visual portrayal of the "fishbone" pattern of road development and associated settlement and deforestation in Rondônia, see Gordon Wells, "Observing Earth's Environment from Space," Chapter 8 in Laurie Friday and Ronald Laskey, *The Fragile Environment: The Darwin Lectures*, Cambridge University Press, Cambridge, England, 1989.

[6] For an evaluation of the environmental and social aspects and impacts of this program and how they were managed, see John Redwood III, *World Bank Approaches to the Environment in Brazil: A Review of Selected Projects*, World Bank, Washington D.C. 1993, and, more specifically, John Redwood III, George Martine, and Eneas Salati, *World Bank Approaches to the Environment in Brazil: A Review of Selected Projects, Volume V: The POLONOROESTE Program*, Report No. 10039, Operations Evaluation Department, World Bank, Washington D.C., April 30, 1992. For other accounts of the Polonoroeste experience in Rondônia and environmentally unsound development of the Brazilian Amazon in connection with major development initiatives, see Adrian Cowell, *The Decade of Destruction: The Crusade to Save the Amazon Rain Forest*, Henry Holt & Company, New York, 1990, Susanna Hecht and Alexander Cockburn, *The Fate of the Forest: Developers, Destroyers, and Defenders of the Amazon*, Verso, New York, 1989 and Bruce Rich, *Mortgaging the Earth: The World Bank, Environmental Impoverishment, and the Crisis of Development*, Beacon Press, Boston, 1994.

[7] This, in turn, is generally a reflection of land clearing either to implant pasture or for small-scale shifting cultivation, which normally takes the form of slash-and-burn agriculture, as well as to exploit tropical timber resources *per se*. In this regard, including recent experience in both the Brazilian (Acre) and Peruvian Amazon regions, see Cheryl A. Palm, Stephen A. Vosti, Pedro A. Sanchez, and Polly J. Ericksen (editors), *Slash-and-Burn*

normally increases -- in land values and prices, which can have a considerable disruptive effect on existing occupation and settlement patterns[8] and also has implications with respect to climate change due to the associated increase in greenhouse gas (GHG), especially carbon dioxide, emissions.[9]

Social disruption has clearly occurred in Darién, for example, where Bank-financed pavement of a section of the existing Pan American Highway resulted in an (apparently unexpected) increase in land prices, triggering significant land speculation and the dislocation of many of the poor small farmers situated along the previously unpaved road corridor, who the project was intended in part to benefit, but many of whom were subsequently forced to move to urban slums, thereby undermining achievement of this objective.[10] This was also a concern in the Bank's first BR-364 road improvement project in Brazil, where existing smallholders were expected to be adversely affected by pavement of the road between Porto Velho and Rio Branco, and, as a consequence, several mitigating measures were included in the project. Since the Porto Velho-Rio Branco project was implemented considerably earlier than the Darién one, however, it is surprising that the Bank did not anticipate a similar potential impact on existing small farmer populations in Panama, even though it did consider such possible effects in the second Acre project, which was prepared and approved around the same time and, like the one for Darién, incorporated the road improvements as part of broader multi-sector "sustainable development" operations (see the section on project preparation and design below).

Agriculture: The Search for Alternatives, Columbia University Press, New York, 2005, especially chapters 7, 8, 10, 12, 15, and 17.

[8] That rural land use varies with distance from markets and is very sensitive to changes in transport costs – and, thus, to major transport improvements, is a basic tenet of the economics of spatial location, as pioneered by Johann Von Thunen in the 1820s, who, according to one source, sought to discover "the laws which govern the prices of agricultural products and the laws by which price variations are translated into patterns of land use." See Michael Chisholm, *Rural Settlement and Land Use*, Aldine Publishing Company, Chicago, 1962 and on agricultural (and urban) location theory more generally, Walter Isard, *Location and Space Economy: A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure*, MIT Press, Cambridge, Massachusetts, 1956, and the role of transportation, Edward J. Taaffe and Howard L. Gauthier, *Geography of Transportation*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1973.

[9] See, for example, Philip M. Fearnside, "Global Implications of Amazon Frontier Settlement: Carbon. Kyoto and the Role of Amazonian Deforestation," in Anthony L. Hall (ed.), *Global Impact, Local Action: New Environmental Policy in Latin America*, Institute for the Study of the Americas, London, 2005.

[10] See Republica de Panamá, Ministerio de la Presidencia, Consejo Nacional para el Desarrollo Sostenible (CONADES), *Evaluación Externa Final del Programa de Desarrollo Sostenible de Darién (PDSD) – Informe Final*, prepared by OTSCORP, SA Optima Technical Services, SA), Panama, June 2011.

More generally, as these two cases illustrate, major road investment projects in natural resource frontier areas can have significant impacts on existing populations in these regions. This is especially the case with respect to vulnerable indigenous communities, which have been present in the larger areas of influence of all of the projects reviewed. In some cases, moreover, these communities may have had only limited contact with non-indigenous populations prior to the opening up of new areas as the result of major road improvement, as was the case with the Uru-Eu-Wau-Wau in Rondônia in the 1980s, but even more acculturated indigenous groups may also be severely affected by such investments, as occurred with the Nambiquara in Mato Grosso due to the same project.[11] IDB road improvement projects have directly or indirectly impacted, or are expected to affect, indigenous communities in all of the cases studied and, in at least one of them, the Pasto-Mocoa highway project in Colombia, this has recently resulted in a claim before the Bank's new Independent Consultation and Inspection Mechanism (ICIM).[12]

As suggested above, however, indigenous populations may not be the only vulnerable groups affected by major road projects and/or road-induced or facilitated developments in frontier regions, and it is necessary to take all of these potential impacts into account in the up-front environmental and social assessments and ongoing environmental and social monitoring and management of such projects, as will be further discussed below. As also noted above, the Bank was particularly aware of such potential impacts in the two road projects in Acre, Brazil, and assigned both an environmental specialist and a social anthropologist to its project team during the preparation and appraisal of the Porto Velho-Rio Branco (BR-364) highway project in the mid-1980s, well before its current environmental and social safeguard policies were in place.[13] This reflected both the World Bank's earlier unhappy experience with pavement of the larger segment of this highway between Cuiabá and Porto Velho, as was clearly acknowledged in the corresponding IDB project appraisal document,[14] but was also a precautionary reaction to the risk of greater deforestation, burning, and social conflict between resident local rubber

[11] See David Price, *Before the Bulldozer: The Nambiquara Indians & The World Bank,* Seven Locks Press, Cabin John, Maryland, 1989.
[12] See Inter-American Development Bank, CO-MICI-001/2011, July 2011, for details of this complaint by two local indigenous groups.
[13] See John Redwood III, *Managing the Environmental and Social Impacts of Major IDB-Financed Road Improvement Projects in the Brazilian Amazon: The Case of BR-364 in Acre*, consultant's report to the Inter-American Development Bank, Washington D.C., July 2011.
[14] See Inter-American Development Bank (IDB), *Federal Republic of Brazil, Porto Velho – Rio Branco Road Improvement Project (BR-0066) Project Report,* Washington D.C., December 7, 1984.

tappers and the more recently arrived larger scale ranchers in southern Acre that later culminated in the well-publicized assassination of the rubber tapper leader and environmentalist Francisco ("Chico") Mendes in December 1988,[15] while the IDB's Porto Velho-Rio Branco road improvement project was already under implementation.

Other types of indirect adverse social impacts are also associated with major road and other infrastructure investments in tropical natural resource frontier areas. This can also be illustrated from experience in the Brazilian Amazon associated with both the aforementioned Polonoroeste program in the western part of the region and the Carajás Iron Ore project in the eastern Amazonian states of Pará and Maranhão, which involved major rail, road, port, and urban development, as well and mine, investments. In addition to the encroachment by new settlers into indigenous reserves in the areas of influence of both of these projects, induced settlement and new productive activities, including artisanal alluvial gold mining,[16] together with the rapid expansion of induced agricultural and cattle ranching activities, led to significant outbreaks of malaria and other tropical diseases in Rondônia and increased prostitution and crime and violence in both subregions.[17] Similar problems, particularly with regard to illegal gold mining, including on local indigenous reserves, are now also occurring in the immediate area of influence of the recently completed Amazonian (i.e., Madre de Dios) portion of the Interoceanica highway in Peru.[18] While this portion of the highway, which was implemented by a private (Brazilian)

[15] For more on the events leading up to this tragedy, see Andrew Revkin, *The Burning Season: The Murder of Chico Mendes and the Fight for the Amazon Rain Forest*, Houghton Miflin Company, Boston, Massachusetts, 1990 and Alex Shoumatoff, *The World Is Burning: Murder in the Rainforest*, Avon Books, New York, 1990.

[16] See, for example, David Cleary, "Small-Scale Gold Mining in the Brazilian Amazon," in Anthony L. Hall (editor), *Amazonia at the Crossroads: The Challenge of Sustainable Development*, Institute of Latin American Studies, University of London, London, 2000.

[17] See Redwood, et. al., op. cit., *World Bank Approaches to the Environment in Brazil*, Volume V, op. cit., and John Redwood III. Anthony Hall, and Eneas Salati, *Volume III: The Carajás Iron Ore Project*, April 30, 1992 and John Redwood III, "Social Benefits and Costs of Mining: The Carajas Iron Ore Project," in Gary McMahon (editor), *Mining and the Community: Results of the Quito Conference,* EMT Occasional Paper No. 11, The World Bank, Washington D.C., April 1998. On the environmental and social impacts of the Greater Carajás Program, in which the World Bank-financed Iron Ore Project was embedded, see Anthony L. Hall, *Developing Amazonia: Deforestation and Social Conflict in Brazil's Carajás Programme*, Manchester University Press, Manchester, England, 1989.

[18] See, for example, Bruce Babbitt, *Manifest Destiny: The Planned Trans-South American Highway Will Wreak Massive Damage on the Fragile Ecosystems of the Amazon and Andes. Worse Yet It Doesn't Even Make Economic Sense. So Why Is It Being Built?*, Americas Quarterly, summer 2009. This problem was also the subject of a Public Broadcasting System (PBS) News Hour segment on November. See also, John Redwood III, *Managing the Environmental and Social Impacts of Major IDB-Financed Road Improvement-Related Projects in Peru: The Interoceanica (or IIRSA Sur) and IIRSA Norte Highways*, consultant's report to the Inter-American Development Bank, Washington D.C., August 2011, which refers to other specific articles in this regard.

concessionaire, was not financed by the IDB, the Bank has provided resources for the improvement of other sections of the road in the Andean highlands (i.e., in the area between Cuzco and Puno) and has provided grant funding to a local NGO to help mitigate some of the potential social and environmental impacts of the road in the Peruvian Amazon.[19]

The direct and indirect environmental and social impacts of major road improvement projects in their areas of influence in tropical frontier regions, finally, are frequently exacerbated by weak local governance in these areas. This is sometimes referred to as the "wild west" syndrome in reference to the experience in the western part of the United States when it too was a dynamic agricultural and mineral resource frontier region in the mid and late 1800s. Among other things, this reflects the incipient nature of many local institutions, including the rule of law. But it also reflects the particular political economy of natural resource rich frontier regions,[20] which tends to place a premium on maximizing short-term private economic gains -- through a process that is often described as "resource mining" even when renewable resources such as forests and soils are involved -- at the expense of longer-term social and local and global environmental benefits associated with the more sustainable use and management of the region's natural resource base and ecological services. Adverse impacts of induced development in such areas may also occur with respect to their often rich biodiversity[21] and sensitive climate. As concerns the latter, more specifically, the potential long-term impacts of climate change resulting from significant deforestation over time in tropical areas such as the multi-country Amazon Basin may be very significant indeed, affecting both the region itself and other areas adjacent to it, including the highly productive agricultural regions in central and southern Brazil, eastern Paraguay and Bolivia, and even northern Argentina.[22] Increasing deforestation in the Amazon

[19] See Redwood, *Managing the Environmental and Social Impacts of Major IDB-Supported Road Improvement-Related Projects in Peru,* op. cit. The specific operation referred to is a Technical Cooperation project entitled *Integrating Conservancy and Sustainable Development in the Southern Interoceanica Highway Corridor*.

[20] With regard to the political economy and governance of frontier regions, see Robert S. Schneider, *Government and the Economy on the Amazon Frontier*, World Bank Environment Department Paper No. 11, August 1995.

[21] See, for example, Thomas E. Lovejoy, "Amazonian Forest Degradation and Fragmentation: Implications for Biodiversity Conservation," in Anthony L. Hall (editor), *Amazonia at the Crossroads*, op. cit.

[22] See, for example, World Bank, Climate Change and Clean Energy Initiative, *Assessment of the Risk of Amazon Dieback*, February 2010.

(and elsewhere in South America), in turn, is directly associated with major new road investments in the region, many of which are being undertaken in connection with IIRSA.[23]

In summary, major Bank-supported road improvement projects, particularly in ecologically sensitive and socio-culturally diverse natural resource rich frontier regions, can – and often do -- result in important local, regional, and national economic benefits. However, they can – and frequently do – also lead directly and indirectly to serious environmental and social costs of local, regional, national, and, in some cases, even global significance. In deciding whether to proceed with such projects, international financial institutions such as the IDB need to fully align and evaluate these potential economic benefits and social and environmental costs, which has generally not been the case.[24] More specifically, the potential positive and negative direct, indirect and cumulative economic, social and environmental impacts of major road improvement (and other infrastructure) projects need to be adequately identified and assessed up-front, and all major highway investment operations, especially in frontier regions, need to be designed, implemented, and supervised by the Bank with the avoidance, mitigation, monitoring, management of -- and, where required, compensation for -- these potential adverse impacts clearly in mind. Indeed, the Bank has attempted to do this over the past several decades, with varying degrees of comprehensiveness and success, and much has – and can be – learned from this experience. The balance of this paper will, therefore, discuss the principal conclusions and lessons that can be drawn from the five country-specific case studies of major Bank-assisted road improvement projects carried out over the past year.

[23] See Timothy J. Killeen, *A Perfect Storm in the Amazon Wilderness: Development and Conservation in the Context of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA),* Advances in Applied Biodiversity Science No. 7, Conservation International, Washington D.C., 2007.

[24] Local and regional economic development benefits of major road improvement projects in frontier regions are often mentioned in project documents, but not quantified or estimated in monetary terms, and the same is true with respect to potential environmental and social costs. In addition, sometimes the potential regional benefits are claimed, even if not quantified, but the associated potential social and environmental costs are not fully identified or glossed over, with the actual ex-ante economic analysis focusing essentially on the estimated travel time and vehicle operation and maintenance cost savings, which are then compared with estimated project investment costs. This analysis should also be done ex-post with actual project costs, which are frequently much higher than estimated at the time of project appraisal (see the section on project implementation and results below), while significantly longer than expected project implementation periods also mean that benefit flows begin later than anticipated ex-ante, both of which have the effect of reducing the actual economic rate of return or benefit-cost ratio of such projects.

D. Project Preparation and Design

The basic approach that the Bank has taken to the preparation and design of major road improvement projects in frontier regions has evolved substantially over the past several decades. Essentially, four phases and differing approaches (with some overlaps) can be distinguished and illustrated respectively by:

i. The Porto Velho-Rio Branco Road Project in Brazil, for which two loans totaling US$ 59.5 million were approved in 1985 and closed in 1997.

ii. The Sustainable Development Projects for Darién (Panama), for which a loan of US$ 70.4 million was approved in December 1998 and supplementary financing of US$ 17.0 million was approved in June 2007 and completed in May 2009, and Acre (Brazil), for which a loan of US$ 64.8 million was approved in May 2002 and completed in June 2010. A variant of this approach, which essentially embedded major road improvements in the context of broader multi-sectoral regional development projects, occurred around the same time in the form of the parallel and contractually interlinked loans for the Santa Cruz-Puerto Suárez Integration Corridor (US$ 75 million) and Environmental and Social Protection of the Santa Cruz-Puerto Suárez Corridor (US$ 21 million), which were approved in April 2002; the former was completed in June 2011 while the latter is still under implementation (with about 65% of the proceeds disbursed as of August 31, 2011) and preceded by two Bank Technical Cooperation projects for associated environmental and social management.[25]

iii. The Guarantee for IIRSA's Northern Amazon Hub Project in Peru for US$ 60 million, approved in February 2006 and still active, and the two interlinked Technical Cooperation grants for selected environmental and social mitigation activities along

[25] More specifically, in October 1999, the Bank approved a US$ 750,000 Technical Cooperation grant to finance a Strategic Environmental Assessment (SEA) of the Santa Cruz-Puerto Suarez Transportation Corridor, which was fully disbursed and completed in December 2000, and in November 2000, a second TC grant in the amount of US$ 150,000 was approved for an Advisory Panel for the Santa Cruz-Puerto Suárez Corridor, which was completed in March 2004.

the Amazonian part of the Interoceanica/IIRSA Sur corridor in Peru, approved in July 2008 and still under implementation (even though the road investment itself has now been completed); in both cases, however, much of the actual road improvements were carried out by private concessionaires and financed by the Andean Development Corporation (CAF).[26]

iv. The Pasto-Mocoa Alternate Road Project in Colombia, for which a loan of US$ 53 million was approved in December 2009 and was preceded by three Bank Technical Cooperation Projects to help assess and address associated potential environmental and social impacts.[27]

This section will discuss how the Bank's approach to managing the environmental and social impacts associated with major road investments in frontier regions during the four stages listed above has evolved since the mid-1980s in further detail, also indicating relevant conclusions and lessons that the Bank itself has learned from them and/or which can be drawn from the experience with the respective project approaches. The principal design features of each of these projects, as they relate specifically to the management of such impacts, will be summarized below, while the following section will focus more specifically on the respective up-front environmental and social assessment experience as part of project preparation.

[26] As noted above, the Bank also financed improvements of parts of the Andean highland sections of the Interoceanica corridor between Cuzco and Puno through the earlier Stage III of the Roads Rehabilitation and Improvement Project, with a loan of US$ 300 million (of which US$ 150 million was later canceled), approved in December 1998 and completed in September 2007 and the National Highway System Serviceability Improvement Project, approved in December 2006 with a contingent credit line of US$ 486 million for investment projects for the National Highway System's Five Year Infrastructure Program for 2006-2010, as well as a Border Crossings Project, including that on the Interoceanica highway between Peru (Madre de Dios) and Brazil (Acre), for which a loan of US$ 5 million was also approved in December 2006.

[27] These projects, more specifically, were: (i) a US$ 1.45 million TC grant associated with the final engineering design and environmental licensing for construction of the alternate Pasto-Mocoa road, approved in November 2006 and reportedly still under implementation, but mainly responsible for financing an updated Environmental Impact Assessment (EIA) for the road itself and a Strategic (later Regional) Environmental Assessment (SEA/REA) for the Colombian portion of the corridor as a whole, similar to that previously carried out for the Santa Cruz-Puerto Suárez Highway in Bolivia; (ii) a US$ 145,000 TC grant for Conservation and Development in High Biodiversity Areas, approved in May 2008 and completed in March 2009; and (iii) a US$ 100,000 TC grant for Productive Development Support of Indigenous Peoples – Sibundoy Valley (within the area of influence of the Alternate Pasto-Mocoa Road), approved in October 2008 and still under implementation.

1. The Porto Velho-Rio Branco Road Project

The Bank justified paving the Porto Velho-Rio Branco section of the BR-364 highway primarily in terms of the benefits for local development that upgraded access and reduced transportation costs would bring to the region. More specifically, pavement of the road was expected to benefit natural resource-based productive activities such as agriculture, cattle ranching, tree cropping, fishing and mining. At the same time, however, the Bank's appraisal report clearly recognized that, as was happening at that time in neighboring Rondônia and Mato Grosso, this process would "increase the pressure on the area's physical and social environments, both of which are relatively complex and fragile." Accordingly, the Bank recommended that "safeguards" be introduced "to minimize unnecessary destruction of the area's soils and forests or damage to the indigenous populations from increased economic activity attributable to improving the road."[28]

Even though an environmental and social assessment was not undertaken up-front, resources to finance a component to better diagnose and mitigate these potential adverse impacts on the environment and local indigenous communities were included in the project. Preparation of this component -- later better known by its Brazilian acronym, PMACI[29] -- during the early stages of project execution was monitored by Bank specialists, as was its subsequent implementation through periodic supervision missions. Responding to strong pressures from international environmental NGOs and the United States Congress,[30] which threatened to cut off future funding to the Bank if it did not take action, inadequate preparation of this component by the Government led the Bank to suspend disbursements for the project in December 1987 – the first time this had happened with any IDB loan to Brazil -- until a more acceptable environmental and social management plan to address the road's impacts was presented to the Bank. This eventually took the form of a Definitive Action Plan (or PAD) for PMACI.

Altogether, PMACI covered an area of 252,000 square kilometers in the neighboring states of Acre, Amazonas and Rondônia. The PAD was composed of subprograms for: (i)

[28] Inter-American Development Bank (IDB), *Federal Republic of Brazil, Porto Velho – Rio Branco Road Improvement Project (BR-0066) Project Report*, Washington D.C., December 7, 1984, pg. 2.
[29] For Proteção do Meio Ambiente e das Comunidades Indígenas (PMACI).
[30] This followed a visit by the aforementioned environmentalist and rubber tapper leader Chico Mendes to the United States Congress in mid-1987 at which time he complained that the potential environmental and social impacts of the project in Acre were not being adequately addressed by the Bank.

territorial organization, including land use planning, in the project's area of influence; (ii) protected areas, including the creation and implementation of conservation units (national forests, environmental protection areas, and an ecological station); (iii) environmental monitoring and control; (iv) environmental education and forestry extension; and (v) protection of indigenous communities, including actions in the areas of health, education, productive activities, and the regularization of indigenous lands.[31] Initially, these activities were to be implemented by federal agencies – as the Bank loan itself was to the Brazilian Federal Government – but due to implementation delays and in response to local government and NGO pressures, management of PMACI was later "decentralized" to permit much greater participation of state agencies and local civil society organizations. The Project Completion Report (PCR) subsequently drew several important conclusions and lessons, which refer mainly to project design and were reportedly taken into account in the design of the follow-on Acre Sustainable Development and other Bank operations involving major road investments in tropical frontier regions, specifically:

i. Environmental and social projects should value regional knowledge and experience, support local initiatives, value the intervention of non-governmental and other civil society organizations that possess mechanisms to respond and intervene in a rapid and efficient manner and at low cost, make available all types of information about the project, permit the democratic discussion of problems, and guarantee the participation of beneficiary communities from the conception phase through the end of execution.

ii. Projects that affect traditional communities (such as indigenous peoples and rubber tappers) should have clearly defined objectives and targets. But at the same time, they need to be sufficiently flexible to permit constant evaluation and adaptation to the needs and circumstances of the local reality, creating agile mechanisms that permit eventual modifications in their specific targets.

[31] Inter-American Development Bank, *Project Completion Report for the Porto Velho-Rio Branco Road Project*, Brasília, no date, pp. 3-4. This report, however, only covers PMACI.

iii. Formulation of an Action Plan that contemplated a variety of environmental problems and issues contributed to project success. Difficulties encountered during the first phase – which could have led to the failure of the project as a whole – were due to the excessive concentration of actions in federal agencies when, in fact, this was a regional project to be implemented in an area that was already highly mobilized and active in terms of addressing its problems.

iv. In terms of what PMACI proposed – to mitigate the effects of pavement of the road – the project was reasonably well dimensioned, especially after reformulation of the specific projects contained in the PAD when the proposed actions and targets effectively incorporated local aspirations and included segments of the population, such as the small farmers, who were largely overlooked in the initial version of the Plan.

v. An unidentified risk was that local institutions were not explicitly included in project design. This resulted in significant pressure -- especially from the Government of Acre, which was allied with NGOs in the state – on PMACI's coordination, which was unable to respond effectively. Not involved in the project, the local entities proceeded with their activities, many of which were parallel to and overlapped with those of PMACI, while the project, which was hampered by institutional, political, and budgetary problems, was able to advance only slowly in its execution. As a result, the project was discredited among its supposed beneficiaries and was largely innocuous in the region, a situation that was only reversed with its decentralization in the second phase.[32]

Other important lessons that can be drawn from this experience not specifically mentioned in the PCR include: (i) the critical importance of the up-front identification and

[32] Ibid., pp. 2, 7-9. The PCR also affirmed that "the most serious problem affecting PMACI, above all in its second phase, was the difficulty encountered by the Ministry of Environment to celebrate formal agreements with and transfer financial resources to the local entities, especially NGOs. This resulted in delays that adversely affected project implementation and meant that many activities took longer to execute than originally programmed. Despite various institutional changes during the second phase of project implementation, these problems were partially overcome by continuity of the technical team responsible for its general coordination."

assessment of potential direct and indirect environmental and social impacts in the project's broader area of influence; and (ii) the need to explicitly incorporate measures to mitigate these impacts as an integral part of the design of the associated road improvement operation itself. As suggested earlier, especially in ecologically and socially sensitive frontier areas such as the Brazilian (and multi-country) Amazon, the identification, assessment, and mitigation of indirect impacts should include induced development effects – such as new migration and land settlement and their potential adverse environmental and social impacts -- in the project's larger area of influence in the case of a major road improvement and, where more than one development intervention is taking place, their cumulative impacts as well. This process should include identification of the institutions responsible for carrying out each such action, their capacity building support needs, and provision of the financial resources required to do so. Subsequent close monitoring and supervision of the implementation and *ex-post* evaluation of the results of these actions by the financing institution or institutions involved are also essential (see the section on supervision, monitoring, reporting, and evaluation below).

A third additional lesson with respect to project design is the need to include specific contractual clauses in Bank loan agreements requiring the Borrower to carry out the necessary environmental and social due diligence and establishing clear sanctions (including the suspension of disbursements) if this does not adequately occur. Similarly, requiring that environmental management measures be included in the contracts with the construction firms responsible for the road improvements and providing resources to strengthen the government – and eventually also non-governmental – organizations responsible for environmental and indigenous peoples' protection were very positive measures. Many of these elements were explicit or implicit in the design of the Porto Velho-Rio Branco road project, and the Bank is to be complimented for establishing and following "best practice" in this regard at a time when environmental (and social) impact assessment was not yet a formal and standard project preparation requirement of most multi-lateral financial institutions (MFIs).

PMACI was also the subject of a Bank multi-stakeholder evaluation seminar held in Washington in December 1994.[33] The seminar concluded both that the way this operation was

[33] See Mary Allegretti, Carlos Ramirez, and Anne Deruyttere (editors), *Public Participation and Sustainable Development in the Amazon: The Case of PMACI*, Inter-American Development Bank, Washington D.C., December 1998. My emphasis.

carried out differed from other IDB-financed "infrastructure projects with an impact on environmentally fragile areas inhabited by indigenous groups" and was particularly "noteworthy because it achieved its objectives at the critical juncture for the Amazon of the 1980s, which was marked by serious social conflicts, high deforestation rates, and criticism of the prevailing development model." More specifically, "PMACI was launched just as the Polonoroeste resources were suspended by the World Bank.[34] Denounced by the potential beneficiaries during its first years of implementation, the project was completed 10 years later with a request for its continuation filed by the same institutions that had rejected the project earlier." Also according to the resulting seminar report,

> PMACI made history in a number of ways. Brazil developed and used innovative management techniques. NGOs and local communities changed the very course of development. For the IDB, the project represented its first large-scale experience in participatory development. Today, it can be asserted that, under…PMACI, the Government of Brazil, local governments, communities, and the IDB learned an important lesson: opening up a forum for dialogue and negotiation can help harmonize overall policies, emphasize local priorities, and resolve conflicts about development….A road through the tropical forest of the Amazon has the potential to cause irreversible environmental damage and increased land conflicts resulting from both the speculative increase in land values and uncontrolled migration. During the life of PMACI (1985 to 1995), both the deforestation and demographic growth rates increased only marginally in the project's area of influence. In other words, the phenomenon (sic) that had occurred during the previous 10-year period in Rondônia was not repeated in…Acre.[35]

This report does not assess the extent to which this favorable outcome was the result of the actions taken under PMACI or was primarily due to other factors, including: (i) the fact that many of the most affected areas in Acre were already occupied by small farmers, rubber tappers,

[34] The World Bank suspended disbursements from all five of its loans for POLONOROESTE in March 1985 just as a new civilian-led federal government was taking office in Brazil and were resumed in August 1985 after the new administration took steps to improve the protection of several highly vulnerable indigenous reserves and agreed to a Bank-proposed agenda for redirection of the program.

[35] Allegretti, Ramirez and Deruyttere (editors), op. cit., pp. 1-2.

and indigenous groups, some of which were already very politically active, (ii) the sharply declining rate of new migration to the region in the late 1980s and early 1990s; (iii) the existence of a very different view of development priorities by, and political constellation of forces in, the state and local governments in Acre compared with those in Rondonia, and (iv) the negative environmental and social consequences, including rampant deforestation, encroachment in indigenous reserves, and serious public health and other social problems (e.g., the widespread incidence of malaria) associated with recent settlement experience in the latter state, which also contributed to the lower migration rate to western Amazônia as a whole. However, project interventions and the Bank's support undoubtedly contributed to the more positive results in the case of the Porto Velho-Rio Branco road. In addition, the seminar highlighted five lessons from PMACI that complement and reinforce those summarized above:

- *Recognition of Land Rights*. The land of the indigenous and extractivist communities, the long-time inhabitants of the region who employ non-destructive systems for natural resource use, were legally protected and their rights over their land recognized according to the historical and cultural peculiarities of each group. This prevented a significant part of the land from being commercialized and its inhabitants expelled to the shantytowns of city outskirts.

- *Decentralized, Participatory Management*. For the first five years, the project was administered in Brasília, with little involvement by local institutions, but the available resources could not be disbursed and the project lost credibility with the beneficiaries. The management system changed by providing direct support for initiatives already under way in the region, with community participation in priority-setting and decentralized allocation of resources, thereby strengthening local organizations and generating sustainable alternative sources of income.

- *Interconnection between Environmental and Social Issues*. The project demonstrated to all the parties involved that there is a complex relationship between economic, environmental, and social problems in tropical forest areas, by expanding the notion of environmental impact mitigation for infrastructure works through specific quality

control measures towards a more integrated vision of social and environmentally sustainable development.

- *Consensus-building and Conflict Resolution through Negotiation*. Conflicts over land ownership and widely diverging development alternatives for the region predated the road and gave rise to violent confrontations, almost causing the project to collapse. The IDB's understanding of its potential role as facilitator with respect to the various groups in confrontation was decisive in reversing the situation and leading to negotiated solutions.

- *Clear Contractual Rules Combined with Flexibility in Execution*. The measures for mitigation of the environmental and social impacts established in the contractual clauses as conditions precedent to disbursement, together with the flexibility allowed in execution of the plans of action, enabled the Bank and the beneficiary communities to adjust project management and achieve effective results in the short term.[36]

Another key design lesson, according to the seminar report, was that "good development projects recognize conflict as part of social life and ensure the institutional and political conditions for them to be explained and a negotiated solution to be reached. PMACI proved that the environmental and social impact of an infrastructure works project could be mitigated if it was recognized that social conflicts express unmet demands and overshadow new types of proposals that require legitimate institutional spaces to be implemented and give rise to new development policies. Regularizing traditionally inhabited areas and strengthening local organizations, converting them into protagonists in the process, generates self-confidence, an essential condition to ensure a sustainable future."[37] The seminar concluded that:

> "[…] the adverse impact of the road was mitigated because the conditions for indigenous groups and local communities to remain in the areas they had traditionally inhabited had been ensured and because their institutions were strengthened. This result was achieved once arrangements were made under the project for the beneficiaries to participate directly in the planning and implementation of activities to which the beneficiaries

[36] Ibid., pg. 2. My emphasis.
[37] Ibid., pg. 12. My emphasis.

themselves had assigned priority. To achieve this objective, the concept and methodology of the project had to be structurally revised during the project execution period. The key to the project's success was to recognize the legitimacy of the existing social conflicts in the area and to ensure their resolution through negotiations by the parties involved, a process facilitated by the intermediation of the Bank and the Government of Brazil."[38]

The report also affirms that PMACI contributed to a "paradigm shift" that "led to the model for sustainable development which has since been incorporated into international development cooperation." While this statement overlooks other contemporaneous participatory initiatives and efforts to promote conservation and environmentally and socially sustainable development in the Brazilian Amazon,39 the PMACI experience is nevertheless instructive as to how the IDB and other development agencies should approach large rural road improvement projects in such areas. However, the seminar also pointed to an important limitation of PMACI: "it had helped discontinue a certain development model, but did not replace it with another. As the impact mitigation component of a road project, PMACI was able to control the environmental and social impact of the road and prevent the occurrence in Acre of the same process that had occurred in other parts of the Amazon. However, precisely because it was just a component, it did not ensure development of the region on a new, sustainable basis." This would require an even broader, multi-faceted approach that, in fact, the Bank would later support through its follow-on project for Acre, as well as through the earlier Darién Sustainable Development and similar projects in Panama, approved in the late 1990s and early 2000s.

2. The Darién Sustainable Development Project

Both the Darién (1998) and Acre (2002) Sustainable Development Projects also included major road improvement components, but, as the PMACI seminar recommended and unlike the earlier Porto Velho-Rio Branco Project, these highway investments were incorporated into larger multi-sectoral regional development programs that sought to introduce key land use planning and

[38] Ibid., pp. 2-3. My emphasis.

[39] One important such initiative, for example, was the G-7 Pilot Program to Conserve the Brazilian Rain Forests, initiated in 1991 and coordinated by the World Bank in conjunction with the European Union and other donors. For more on this and other World Bank supported programs in the region, see John Redwood III, "World Bank Approaches to the Brazilian Amazon: The Bumpy Road towards Sustainable Development," in A. L. Hall (ed.), *Global Impact, Local Action*, op. cit., pp. 81-125.

controls and promote environmentally and socially sustainable development more broadly in the areas of influence of the roads to be paved, and in advance of these road improvements per se. As observed above, a largely similar approach was taken by the Bank in the Santa Cruz-Puerto Suaréz road corridor in Bolivia (also approved in 2002), but there was a very important difference with the Darién and Acre projects in that the road investment and parallel environmental and social management components of the Bolivia program were financed by separate Bank loans, which later became "delinked" during implementation, effectively undermining the original design intention to ensure that adequate environmental and social safeguard measures were in place before the road improvements were made (see the section on project implementation and results below).

The Loan Proposal document for the Darién Sustainable Development Project describes a typical tropical natural resource frontier situation characterized by rapid and largely uncontrolled occupation and land use in a setting of considerable ecological sensitivity and ethnic diversity. As is generally the case in other such regions, the area also possessed weak local institutions and poor governance. In Darién, moreover, local indigenous groups were characterized by "organizational confusion" and needed "to resolve land tenure problems, in addition to strengthening their governing bodies" so that they could "play an effective role in project development."[40] In addition to the need to pave a section of the existing Pan American Highway in order to help the province realize its economic growth and poverty reduction potential, the project document described the rationale for IDB involvement, which was framed largely in environmental and social terms, as follows:

> The proposed operation seeks to reverse current trends that are destroying the ecosystem of Darién by instituting the concept of sustainable development in terms of striking a dynamic balance among human, ecological and economic factors. Progress towards such a balance will only be possible to the extent that cultural and biological diversity can be safeguarded and promoted. The major problems relate to: (a) protecting natural resources that are of great richness and variety and at the same time very fragile, and where human intervention to date has been unsustainable because of the ways in which the forest, the soil and the fishery (sic) have been exploited; and (b) the need to provide support for

[40] Inter-American Development Bank, *Panama – Darien Sustainable Development Program (PN-0016)*, project document, 2002, pg 4.

people who are the poorest in the country, and whose economic opportunities under current systems of production are severely limited.[41]

In this context, the project's visionary, but ultimately overly ambitious, declared objectives were to: (i) establish an effective land use management plan in keeping with the area's natural resource features; (ii) reduce the pace of deforestation and the conflicts over natural resource use, and stabilize the agricultural frontier; (iii) enhance the capacity of the institutions responsible for resource management; (iv) strengthen managerial and supervisory capacities at the regional, municipal and indigenous community levels; (v) promote changes in the existing models of production and natural resource exploitation so as to ensure their sustainability; (vi) rehabilitate the transportation system, in a manner consistent with the Land Use Management Plan; (vii) improve access for the local population to basic services (health, education, water and sanitation, electricity and community services); and (viii) coordinate program activities with those of other institutions and donors. By far its most costly component, however, was pavement of 134 kilometers of the Pan American Highway and rehabilitation of a number of feeder roads, together with smaller transport investments for local port and airport improvements. The other project components were for: land use planning, titling, management and protection of natural resources; institutional strengthening; small-scale productive activities; and the upgrading of basic services.

An interesting feature of project design was a so-called "Environmental and Social Sequencing Matrix" which, together with a "Strategic Plan," was developed in the words of the Bank's Loan Proposal document because of the need to "program investments strategically over time and space….and to anticipate and minimize the environmental impact of certain investments, such as the rehabilitation of the [Pan American Highway] and other infrastructure works."[42] The Strategic Plan indicated the timetable of activities by "work fronts" and, within each one, by subzone, as well as over time. On the basis of this plan, the sequencing of required environmental and social protection and mitigation measures was presented in the Matrix, which specified "the conditions that must be fulfilled before initiating investments with significant

[41] Ibid., pg. 7. A similar approach would subsequently also be taken by the Bank in two other ecologically and socio-culturally diverse provinces in western Panama, Bocas del Toro and Chiriquí, not covered in the present review.
[42] Ibid., pp. 12-13. My emphasis.

impacts."[43] The Matrix was agreed during project negotiations and was to be incorporated as an annex to its operating regulations, any change in which would require prior Bank approval. Compliance with the Matrix would also reportedly be a condition for approval of the project's annual operating plans and linked to specific performance indicators and verification methods.

Supplemental financing was later (2007) required to complete the infrastructure – mainly road improvement -- works on account of significant cost overruns. According to the corresponding loan proposal document, these were due to: (i) increases in the prices of the products, inputs, and materials required to complete the planned works, some of which were delayed initially pending fulfillment of the conditions established in the program's Environmental and Social Sequencing Matrix; (ii) the need to change the specifications of some projects due to additional requirements and soil conditions; and (iii) underestimation of the costs of program works (due to the inaccessibility of the province, contractors reportedly incurred higher than expected costs). As a result, estimated total project costs increased from US$ 87.4 to US$ 109 million, and the Bank's financing from US$ 70.4 to US$ 87.4 million.[44]

In addition to the cost overruns and implementation delays, a number of other problems affected project execution, including, as suggested above, the need to meet the pre-determined environmental and social management "sequencing" requirements included in the Matrix prior to proceeding with the road investments, all of which ultimately contributed to the only partial achievement of the project's objectives and intended outcomes (see the section on project implementation and results below). In this regard, however, an important lesson was drawn by the Bank at the time the proposal for supplemental funding was put forward. The additional financing request observed that the Darién Project required the "completion of strategic activities to establish an appropriate legal and institutional framework before proceeding with construction of the planned infrastructure works and basic services." But given that, in 1999, the IDB had no alternative financing instruments, a project was prepared that incorporated all of the estimated

[43] Ibid., pg. 28. In defining this sequencing, two levels of territorial zoning were reportedly taken into account. The first included three Integrated Management Zones. The second subdivides these zones into protected areas or reserves and Sustainable Development Zones (ZDS). Priorities among these areas were reportedly "based on the importance of each one in the region's environmental and socioeconomic context, on the risks of disturbance involved in the program, as well as on the indirect effects of infrastructure investments and on the complementarity of the various activities and projects. Using these criteria, three work fronts were defined to determine the spatial sequencing of execution." My emphasis.

[44] Inter-American Development Bank, *Panama – Supplemental Financing for the Darién Sustainable Development Program (PN L1017) – Loan Proposal*, Washington D.C., 2007, pg. 12.

costs for the proposed investments, including rehabilitation of sections of the highway, pursuant to the agreed Environmental and Social Sequencing Matrix. In the absence of a "multiphase operation instrument" at the time the project was approved, this was the only solution possible. But the additional financing request document observed that such an instrument had become available by 2007 and that would have allowed the project to proceed in discrete phases through two or more sequential Bank operations, rather than a single one, would have been "ideal" for this type of intervention.[45]

In this regard also, finally, one of the main conclusions of the Darién case study, as stated in the respective report, was the following: the project "took an innovative approach to anticipating and addressing the potential adverse direct and indirect impacts of a major road improvement by incorporating this investment in a broader multi-sectoral regional development operation, which ambitiously sought at the same time to boost economic development, alleviate rural poverty, and protect biodiversity and other renewable natural resources. The request for supplemental financing later observed that, in retrospect, it would have been better if the Bank had supported this program through a multi-phase set of projects with the first one seeking to implement the essential preconditions in terms of environmental and social management and protection, including the required land use controls and institutional strengthening, and the second financing pavement of the highway and other infrastructure improvements together with the expansion of basic services."[46] This conclusion continues to be valid, but the Bank has not yet effectively implemented such a two stage approach for subsequent road improvement projects in frontier areas – even though such a two phase approach was proposed for the Santa Cruz-Puerto Suárez operation, but later fell through (see below) -- except insofar as prior environmental and social assessment work has occurred through prior Technical Cooperation operations. However, this is not the same as putting land use and other environmental and social controls in place along the corridors of roads to be built and/or paved in such regions well in advance of actual construction work.

[45] Ibid., pg. 8.
[46] John Redwood III, *Managing the Environmental and Social Impacts of a Major IDB-Financed Road Improvement Project in Panama: The Case of Darién*, consultant's report to the Inter-American Development Bank, Washington D.C., November 2011.

3. The Acre Sustainable Development Project

The Acre Sustainable Development Project took an approach similar to the Darién Project by "packaging" environmental and social, including land use and environmental management, components together with – and requiring that they be largely implemented in advance of – the road investments, which included pavement of another section of the BR-364 in the state, together with improvement of several other roads. And it seems to have been considerably more effective than the Darién operation, largely due to the combination of the much greater distance of the road to be paved from more settled areas and the much stronger local political commitment to environmental management objectives and activities, already evidenced in the previous Bank highway improvement project in Acre, as discussed above.

The general objective of the project was "to improve the quality of life of the population and to preserve the natural wealth of the state of Acre in the long term."[47] To achieve this objective, the project had three components, respectively labeled sustainable management of natural resources, support and promotion of sustainable production and employment, including in sustainable forestry, and public infrastructure for development, mainly road improvements, including pavement of 70 kilometers of the BR-364 highway. Activities to be financed under the first component, more specifically, were intended to help: (i) resolve the irregular land tenure situation in the state; (ii) create and administer a state system for the conservation of protected natural areas, implement three comprehensive protection units involving a total of 220,000 hectares, and protect the surroundings of an existing National Park; (iii) continue to improve the institutional capacity of the state government to implement environmental legislation; and (iv) value the cultural identity of 12 indigenous groups and extractivist and riverine populations.

The corresponding Bank project report does not explain why the specific segment of BR-364 to be paved was selected or what justified its upgrading at this particular point in time, but it was apparently one of the last segments of the road providing access to areas where sustainable forestry could be carried out that did not yet possess an all-weather surface. The report nevertheless affirms that "the proposed Program has been structured such that the investments in road transportation infrastructure will be economically viable and implemented once the capacity for environmental management, surveillance, and control is in place in the area of influence, so

[47] Inter-American Development Bank, *Brazil – Acre Sustainable Development Program (BR-0313) – Loan Proposal*, Washington D.C. Executive Summary, pg. 1.

as to minimize deforestation."[48] Thus, as in the case of Darién, even in the absence of a formal "Environmental and Social Sequencing Matrix," the strategic approach taken by the Bank in this operation was not to implement the road improvements until after proper land use, land tenure, and other environmental controls in the area expected to be affected were in place.

Bank safeguard requirements were clearly quite different at the time this project was appraised and approved than when the Porto Velho-Rio Branco road improvement operation was processed in the mid-1980s. Echoing the recommendations of the earlier Bank seminar on PMACI, however, preparation of the new operation reportedly also incorporated key lessons from the earlier one, more specifically that: (i) environmental projects which affect traditional populations require the active participation of the affected communities from their design until their final implementation; (ii) decentralization of the implementation of sustainable development projects to local organizations and participation of civil society institutions in project execution reduce the possibility of conflict and allow for an appropriate pace of implementation; and (iii) participation mechanisms for the beneficiaries of socio-environmental projects should be provided for in the loan agreement.[49]

In addition, as now required both under Brazilian law and Bank safeguard policies at the time the project was appraised, the State Government prepared an environmental impact assessment (EIA) in 1996 for the road section to be paved. This assessment was revised and broadened to cover the entire proposed project at the Bank's request in 2001. According to the project report, the EIA and its associated mitigation plan "followed a broad process of consultation with the parties affected, including indigenous groups, through public hearings. The mitigation plan, reviewed and approved by the Bank, includes specific actions in the areas of production, health, education, land tenure regularization, valuing of indigenous culture, environmental management, the obligation to include a code of conduct in the terms of reference for the contractor firms and staff in relation to the local society and the environment, and the strengthening of local organizations."[50] This EIA will be further discussed in the next section.

[48] Ibid., pg. 7. My emphasis.
[49] Ibid., main text of the loan proposal report, pg. 5.
[50] Ibid., pg. 26. There is no further description of the original EIA and/or the updated assessment in the appraisal report but copies of the pertinent documents are housed in the Bank's Public Information Center.

The PCR, issued in October 2010, which judged the project's outcome to be "satisfactory" overall, drew several relevant conclusions and lessons in relation to its design (and subsequent implementation), including the following:

- The project's methodology…whose key was the strictly respected sequencing of interventions and which inhibited uncontrolled occupation of land by immigrants without titles, to the contrary of what occurred in areas adjacent to previous[ly improved] stretches of BR-364.[51]

- The existence of a high level of political will and commitment on the part of the state and municipal governments, which created a very favorable environment for project progress, together with SEPLAN's (i.e., the Secretariat for Planning and Economic Development) leadership and the collaboration of a variety of institutions that allowed the project to overcome the high risk of conflicts and inefficiencies as a result of the multiplicity of stakeholders and technical areas involved.

- Application of the concept of sustainable environmental management by the state Secretariats involved in order to reconcile deforestation and development in project activities.

- Strong social mobilization, consolidated by cooperatives and environmentally oriented social movements, which contributed to totally inhibit any type of land speculation in the project area, at the same time strengthening the cultural identity of the communities involved, avoid conflicts, and contribute to project implementation.[52]

[51]Inter-American Development Bank, *Relatório de Término de Projeto – Programa de Desenvolvimento Sustentável do Acre*, Brasília, October 29, 2010, pg. 13. More specifically, this refers to the following sequence of actions: (i) mapping of the areas communities, and the cadastral situation prior to construction; (ii) dialogue with existing populations, especially with the traditional (e.g., rubber tapper, small farmer) and indigenous communities, which facilitated communication with local authorities regarding land invasions; (iii) the presence of the Acre Environmental Institute (IMAC) in different localities on the ground, its use of remote sensing technologies and its monitoring and control ("fiscalização") of forest fires and deforestation which has complemented the control of land invasions; and (iv) the mitigation measures for socio-environmental impacts required in order to obtain a permit from IMAC.

[52] Ibid., pp. 13-14.

In particular, the PCR highlighted the "commitment of the government of Acre since 1999 [which] has permitted the new equilibrium between the protection of natural resources with social inclusion and the growth of the chain of forest products and associated businesses." It further affirmed that "without the increase in political will and broad and consistent dissemination of concrete policies, achievement of the Program's targets would not have been feasible." Finally, the PCR concluded that this project demonstrated that, "applying the concept of environmental sustainability in all the actions of the Program, with participation of all the affected stakeholders, demonstrated definitively that, even in Amazonia, it is possible to invest in transport infrastructure without increasing deforestation."[53]

In summary and reinforcing what was stated above in relation to the Darién project, the general conclusion that can be drawn from this experience, together with that of the previous Bank road improvement operation involving the BR-364 highway in Rondônia and Acre can be summarized as follows: Taken together, these two largely successful Bank operations provide rich lessons with respect to the identification and management of social and environmental impacts of major road improvement projects in the Brazilian Amazon and other agricultural and ranching frontier regions. The most important of these are that: (i) both the potential direct and indirect -- including induced development and cumulative -- social and environmental impacts of these investments need to be identified, assessed, and adequately addressed; and (ii) doing so requires taking a broader sustainable development approach to – and in -- their respective (direct and indirect) areas of influence, which also need to be clearly identified and well understood in terms of their ecological, demographic, economic, social, political and institutional characteristics and dynamics in advance of project implementation. An important corollary of the second lesson is (iii) the need to effectively involve all affected local stakeholders -- and especially those most vulnerable to the social and environmental impacts in question -- in the process of identifying and monitoring these effects and, to the extent possible, ensuring their active participation in the implementation and evaluation of the associated measures to mitigate and/or compensate for them. Finally, (iv) for this to occur strong and persisting political

[53] Ibid., pp. 16-17.

commitment at the local (i.e., in this case, state and municipal) level is clearly critical.[54] These lessons will be further elaborated below.

4. The Santa Cruz-Puerto Suarez Corridor Program

The complex but nearly simultaneous Santa Cruz-Puerto Suarez road corridor development in Bolivia differed from the Darién and Acre projects in that the Bank was involved in paving only part of the road, with improvement of other sections financed by other donors, including CAF and the European Commission (EC).[55] This program was also initially intended to involve two discrete phases, perhaps based in part on the lesson learned from the Darién project mentioned above with respect to the advantages of taking a multi-phased approach, but more likely due to short-term counterpart funding constraints on the part of the Bolivian Government which also affected other program components. In addition and in parallel to its road upgrading investment, the Bank financed an environmental and social protection project for the entire length of the corridor between these two cities.[56] Prior to approving the loans for these two interlinked projects in April 2002, the Bank provided Technical Cooperation grants to the Bolivian Government in 1999[57] and 2000[58] to strengthen the required EIA and undertake a Strategic Environmental Assessment (SEA) of the road's impact along the entire corridor, and to support the activities of an Advisory Panel, respectively.

According to the Executive Summary of the Bank's Loan Proposal (LP) for the road improvement operation (BO-0036), the goal of the larger program, of which this project was an

[54] See John Redwood III, *Managing Environmental and Social Impacts of Major IDB-Financed Road Improvement Projects in the Brazilian Amazon*, op. cit., pp. 27-31.

[55] More specifically, according to the appraisal report, the Bank would finance pavement of the 124 km section of the road between Paraiso and El Tinto and maintenance of an existing 140 km gravel section of the highway between Roboré and El Carmen (whose bridges would be financed by the EC and pavement was scheduled for an eventual second phase), and of the recently rehabilitated 88 km gravel section between El Carmen and Puerto Suarez, while pavement of the 82 kilometer El Tinto-San José de Chiquitos section would be financed by the EC, and that of the 140 km San José de Chiquitos-Roboré section by CAF. The existing 61 km Santa Cruz-Pailón-Paraiso section was already paved and did not require additional construction work, while construction of a new Palias bridge along this section would be financed by the EMIMBANK of Korea. See Inter-American Development Bank, *Bolivia: Santa Cruz-Puerto Suarez Corridor Project, Phase I,* Washington, D.C. 2002 for additional details.

[56] See Inter-American Development Bank, *Bolivia: Environmental and Social Protection in the Santa Cruz-Puerto Suárez Corridor* (BO-0033), Washington D.C. 2002.

[57] See Inter-American Development Bank, *Bolivia: Plan of Operations – Strategic Environmental Assessment of the Santa Cruz-Puerto Suarez Transportation Corridor (TC 9904003-BO),* Washington D.C., October 1999.

[58] A specific Plan of Operations for the TC could not be found in the Bank's files, but it was reportedly approved in November 2000 and completed in March 2004, with cancelation of US$ 30,000 of the original US$ 150,000 grant.

essential part, was to "improve Bolivia's integration with the region and international markets, while promoting economic efficiency in the various regions and production sectors by reducing transport costs and travel time, with improved highway conditions and traffic safety."[59] Its specific objectives, in turn, were to: (i) lower transportation costs; (ii) reduce travel times; (iii) guarantee that the highway remains passable from the beginning of construction; and (iv) improve transportation safety for drivers and passengers and their cargoes along the Santa Cruz-Puerto Suárez Corridor. More concretely, the Program was expected to consist of the resurfacing and construction of various sections of the road, reportedly including "refurbishing the roadbed and paving of 571 km of highway in two phases, guaranteeing continuous serviceability throughout the corridor." The LP observed that "environmental strengthening and mitigating measures will be carried out at the same time under a separate program financed in its entirety by the Bank."[60] The first phase of the IDB-financed part of the road improvement part of the program was expected to cost US$ 90 million and the second phase, US$ 87.5 million, including a prospective second IDB loan of US$ 70 million. Proceeding to the second phase of the program would be contingent upon meeting certain conditions set out later in the LP.

The road improvement project was also justified in the following terms:

> In addition to linking the local economy, the highway forms part of an East-West corridor connecting countries on the Atlantic coast (primarily Brazil) with Chile and Peru. The corridor itself has been identified by IIRSA as a vital route with the greatest potential for regional integration, this highway being the final link and thus of great importance for completing the corridor. Specifically, it will strengthen Bolivia's links to MERCOSUR -- especially Brazil and to a lesser degree Paraguay -- and, via the Hidrovía Paraguay-Paraná, improve access to Argentina, Uruguay and the markets of Europe and North America. Given these considerations, upgrading this highway has a very high priority in the Government of Bolivia's development plans.[61]

[59] The main text of the LP defines the Project's main objective in somewhat different terms: "to improve economic integration of Bolivia's eastern region and support development of the production sector through better communication with domestic and international markets," IDB, *Santa Cruz-Puerto Suárez Corridor Project, Phase I*, op. cit., para. 2.1, pg. 19).

[60] Inter-American Development Bank, *Bolivia: Santa Cruz-Puerto Suarez Corridor Project, Phase I*, Washington, D.C. 2002, Executive Summary, pp. 1-2.

[61] Ibid., Main report, pp. 1-2.

The LP also indicates that financing had been arranged for both phases of the Program, with that for the first phase consisting of a combination of grants and concessional and commercial funding. The main source of financing for the first phase of the Program would be CAF, which was expected to provide "a maximum of US$ 100 million under commercial terms and conditions,"[62] with the Bank lending US$ 75 million and the EC providing a grant of US$ 47.5 million. The second phase was expected to be financed primarily by the Bank, OPEC, and CAF. Counterpart funding for both phases would come from the Bolivian Government, including a contribution from the Prefecture of Santa Cruz.[63] However, in practice, it appears that the additional road paving actions that had originally been intended to be implemented during the proposed "second phase," were, in fact, undertaken at the same time as the "first phase," so that the subsequent Bank loan became unnecessary. However, this was one of the actions taken while the project was under execution that essentially undermined the program's original design with respect to its proposed environmental and social management and protection measures (see the section on project implementation and results below).

The LP for the "first phase" of the road improvement project contained a specific section on social and environmental feasibility and associated recommendations. It began by affirming that "given the nature of this project (virtually a 'greenfield' operation), with a highway to be built over a very broad geographical area which is highly vulnerable, both socially and environmentally, has only a very basic level of development with little consolidation, yet also enjoys enormous economic potential, the preparation of this initiative has had to take account of both its direct and indirect impact, and its cumulative and long-term effects." It also argued that, considering the extent and complexity of the operation's likely indirect effects, "it would be best to separate the financing of its construction works from efforts to mitigate its environmental impact, by preparing an independent project to deal with the latter." Hence, the environmental and social protection project (BO-0033) was prepared in parallel. This report observed further that:

> The construction and upgrading of the Santa Cruz-Puerto Suárez corridor will lead to a major expansion of the agricultural frontier and the forestry sector. These and other effects can only be seen as positive developments when adverse social and environmental

[62] Ibid., pg. 20. The table on the next page, however, indicates a CAF loan of US$ 90 million for the first phase.
[63] Ibid., pg. 21.

> effects are controlled and mitigated. This is what BO-0033 is designed for, and for this reason it is essential that the programs set out in BO-0033 be implemented on the dates and in the form described. BO-0033 includes all of the environmental mitigation activities, and covers the corresponding costs, for mitigation of the indirect effects (Plan of Action) caused by improvements made to the corridor. With regard to direct effects (the PPM-PASA program),[64] BO-0033 includes environmental mitigation activities, and covers the costs corresponding to the first phase of the Highway Project. Mitigation of direct effects during the second phase will have to be financed by [the proposed follow-on loan], following criteria consistent with those adopted for this Project.[65]

According to the respective Loan Proposal document, the parallel Santa Cruz-Puerto Suárez Environmental and Social Protection Project was designed to meet the needs identified in the Strategic Environmental Assessment (for further details see the next section), "particularly as regards the need to implement a series of environmental protection measures and measures to ensure regional sustainable development that will: (i) assure that works to improve the Santa Cruz-Puerto Suárez Corridor are carried out within the framework of a process of regional occupation that is planned and controlled and that does not pose risks to socio-economic relations and natural ecosystems; (ii) assures that benefits of agricultural development and forestry that result from the road works will benefit all inhabitants of the area of influence as well as minimize any negative impacts on biodiversity and environmentally fragile zones, and that rights acquired by indigenous and small-farming communities are respected by carrying out a broad program to register and provide titles for land; and (iii) contribute to socio-economic development in the zone of influence of the Santa Cruz-Puerto Suárez Corridor, optimizing the use of natural resources." It also affirms that "all of the above requires that: (i) the prevention and compensation programs that are high priorities in the SEA (concession of property titles for land, protection of vulnerable zones, etc.) should be in place before the works begin; and (ii) the

[64] PPM was the Prevention and Mitigation Plan and PASA was the Environmental Applications and Management Plan which are further described in the appraisal document for the parallel environmental and social protection project.

[65] *IDB, Bolivia: Santa Cruz-Puerto Suárez Corridor Project*, op. cit., pp. 54-55. It then states that "the cost of mitigating environmental impact is an integral part of the budget for construction of each section, and includes the measures and works required by in the Highway Project's EIA, in accordance with environmental technical standards and the Code of Conduct of the workers." My emphasis.

Bank's future loan to improve the highway include conditions that link disbursements to progress in the mitigation of the project's environmental impact."[66]

Thus, as in both the earlier Darién and nearly simultaneous Acre Sustainable Development Projects, the Bank's intention was clearly to sequence the implementation of critical environmental and social protection and road investments along the Santa Cruz-Puerto Suárez corridor in such a way that the former were essentially in place before the latter were initiated. Rather than containing these measures in one operation financed by a single loan, however, they were housed in two parallel projects funded by separate Bank loans, with cross-conditionality in their respective legal agreements. When the two parallel operations are considered together, at least conceptually, they formed part of a single sustainable development type program, largely equivalent to those the Bank was supporting at the same time in Panama and western Brazil, although with the added feature of dividing both the road improvement investments and some of the associated required environmental and social protection activities into two distinct phases. To add to this already very ambitious and complex design and also differently from the Bank-financed projects in Darién and Acre, multiple donors were involved in the road improvement parts of the Bolivia program, all of which were on somewhat different schedules, which would also further complicate Borrower implementation and Bank supervision of the parallel environmental and social management activities that were designed to cover the entire 571 kilometer corridor (see the section on project implementation and results below).

Project design also incorporated other innovative features. The LP recognized, appropriately, for example, that some of the indirect environmental and social impacts of the road improvement project would only be felt over the longer term, well beyond the construction phase, such that that "some mitigation programs must be continued in order to achieve balanced development in the area of influence." Arguing that institutional and financial mechanisms should be established to permit continuation of required mitigation activities, it concluded that three subprograms would need a longer implementation period than the first construction phase, with the former being estimated at ten years, specifically: (i) the Subprogram for Indigenous Organizational Development, which would seek to strengthen "indigenous coalitions so that they can defend the interests of indigenous peoples and participate in the development process of the

[66] IDB, *Bolivia: Environmental and Social Protection in the Santa Cruz-Puerto Suárez Corridor*, op. cit., pp. 10-11. My emphasis.

zone;" (ii) the Subprogram for Management of Protected Areas, for which the executing agency, SERNAP [the National Protected Area Service], needed to "be equipped with the resources and sufficient personnel in order to counteract additional pressure on the land that is caused by the highway, particularly once the highway is operational;" and (iii) the Subprogram for Forest Conservation, for which the Forestry Superintendency (SIF) needed to "be provided with resources to counteract additional pressure on the land that the highway will bring to forested areas within the Area of Indirect Influence, particularly once the highway is operational."[67] The LP also observed that current conditions in Bolivia meant that "the country does not have enough financial resources (neither loans, nor counterpart) to cover the total costs of mitigation programs." Thus, it was considered necessary to "design creative financial mechanisms in order to generate sufficient resources to cover these costs and ensure sustainability of investments." The solution proposed was to set up three fiduciary funds with "reputable" civil society organizations, expected to "assure technical capacity and transparency in the channeling of resources."[68]

It should also be observed that the original scope and cost associated with the management plans initially proposed by the consultants who carried out the SEA were reportedly many times greater than the amounts eventually financed under the two parallel IDB loans. This was apparently due in part to the fact that the consultants had originally considered a much larger geographic area to be the indirect area of influence of the road, an area that the Bank considered to be both inappropriate and unmanageable. As a result, the size and costs of the proposed environmental and social management measures were subsequently pared down to a level deemed more realistic by the Bank. Even after this occurred, however, the scope and estimated cost of the environmental and social protection measures to be financed through the two loans were still expected to be substantially larger than those that were finally included in these projects and needed to be further reduced as a result of the Government's financial constraints

[67] Ibid., pg. 11.

[68] Ibid., pp. 11-12. The LP noted further that "the decision to propose setting up these funds was also based on the following: (i) the need for a mechanism to administer funds independently that will contribute to eliminating political interference in the execution of subprograms; (ii) in order to avoid Bolivian legislation which requires that government funds be deposited in the national currency, with the high risk that these funds lose their dollar value because of periodic devaluations of the Bolivian peso; (iii) so that commitments will be complied with after negotiations with representatives of indigenous organizations, the government, NGOs, and other interested entities; and (iv) in order to fulfill the specific petition of indigenous communities that they be able to manage resources through entities that represent their interests."

mentioned above. In addition, according to a Bank source familiar with the history of this project, the main reason why the road improvement investments and the associated environmental and social protection interventions along the Santa Cruz-Puerto Suárez corridor were eventually financed by the Bank as two separate, although legally interlinked, projects, was because the original size of what was to become the actual BO-0033 had been considerably larger. The limited availability of the "softer" Special Operations Funds (FOE) for Bolivia was apparently also a constraint at the time. These decisions were reportedly taken in consultation with Government authorities during the course of regular Bank programming missions to Bolivia in the early 2000s.

The environmental and social protection project for the Santa Cruz-Puerto Suárez corridor that the Bank and Government finally agreed to support had three components with the following declared objectives: (i) an SEA-based Action Plan, with the specific goal of preventing, controlling, mitigating and compensating for indirect, cumulative and long-term impacts caused by development spurred by the Corridor project, as well as to promote a more equitable distribution of the project's benefits; (ii) the aforementioned Prevention and Mitigation Plan and Environmental Applications and Monitoring Plan (PPM-PASA), which SNC [the National Road Service, which was responsible for implementation of the road improvement investments] must comply with, as stipulated by Bolivian legislation, to control, mitigate and compensate for indirect impacts of the highway's construction and operation; and (iii) a Socio-Environmental Management System to coordinate and supervise program actions. The first two of these components, in turn, included the following subcomponents: (i) a land "sanitation,"[69] titling and registry program; (ii) an indigenous program; (iii) an environmental conservation program; (iv) an institutional strengthening and municipal sustainable development program; (v) a losses compensation program; (vi) an environmental supervision during construction program; and (vii) an environmental auditing of the highway program, in addition to the "Management System and Socio-Environmental Management" Component.[70]

[69] "Sanitation" in this context refers to the clarification of actual legally binding land documentation and ownership.

[70] These program are further described in the respective case study report (see John Redwood III, *Managing Environmental and Social Impacts of a Major IDB-Financed Road Improvement Project in Bolivia: The Santa Cruz-Puerto Suárez Highway,* consultant's report to the IDB, Washington D.C., October 2011, pp. 26-28) and in greater detail in the project appraisal document (Ibid*).*

According to the LP, finally, the Project "would finance: (i) all programs within the Plan of Action; and (ii) PPM-PASA programs related to the first work phase of the highway, which should conclude by 2006; and (iii) the Socio-Environmental Management System for the first phase during which the Project Executing Unit (UEP) will be working with a full staff. At the same time the Project will finance the UEP with a reduced staff and independent financial and technical-environmental auditing, between 2007 until the first trimester of 2012." It also affirmed that PPM-PASA actions during the proposed second phase would be financed by the second phase of the Corridor (i.e., road improvement) project, noting, finally, that "during the final construction phase (projected for 2007-2008), the environmental component of the Highway project with the implementation of the Action Plan will not differ from a typical highway project which does not require a specific loan operation nor a special management system."[71] As will be shown in the section on project implementation and results below, the actual project execution experience turned out quite differently from what the Bank originally intended and expected, and, thus, the complex design of the parallel and sequential loan program for the Santa Cruz-Puerto Suárez Corridor, in practice, has proven unworkable.

5. The Interoceanica (or IIRSA Sur) Highway

Like the Santa Cruz-Puerto Suárez road in Bolivia, the Interoceanica and IIRSA Norte roads in Peru are key elements in IIRSA's priority program for regional integration through major infrastructure investments. Launched in 2000 at the instigation of then Brazilian President, Fernando Henrique Cardoso, the IDB has helped to coordinate and finance the Regional Infrastructure Integration Initiative for South America, together with CAF and the Plate River Basin Financial Development Fund (Fonplata), which jointly compose the Technical Committee providing support to this multi-country initiative.[72] These Peruvian road corridors are centerpieces of two of the ten IIRSA "integration and development axes" or "Hubs," for "Peru, Bolivia, Brazil" (i.e., IIRSA Sur)[73] and the "Amazon Region" (IIRSA Norte), respectively.[74]

[71] Ibid., pp. 15-16.
[72] See Inter-American Development Bank, *A New Continent under Construction*, op. cit.
[73] This axis, more specifically, included three groups of projects as of 2006, one of which would link the state of Acre in Brazil to the eastern side of the Andes and the Peruvian coast by road and another to link La Paz and the Bolivian plains with the Amazon basin, corresponding to the Interoceanica and Santa Cruz-Puerto Suárez highways, respectively *(Ibid.*, pg. 19).
[74] Ibid., pp. 18-19.

IIRSA's first ten years were completed at the end of 2010,[75] but the initiative is expected to proceed, and the IDB has been asked to continue to be involved in its technical coordination, under the auspices of UNASUR's[76] Council for Infrastructure and Planning, COSIPLAN,[77] in the years ahead.

The Interoceanica or IIRSA Sur highway is part of an ambitious long-term national road investment plan in Peru that involves construction of three longitudinal (i.e., also including IIRSA Central and IIRSA Norte) and twenty transversal highways. Altogether, the IIRSA Sur undertaking entails the construction or upgrading of some 2,600 kilometers of roadway linking the Peruvian ports of San Juan de Marcona, Matarani and Ilo, south of Lima/Callao, to southwestern Acre in Brazil. From there, this highway connects to the port cities of Santos, near São Paulo, and Rio de Janeiro (and everywhere in between) through the existing paved national highway network in Brazil. Thus, it ultimately links major ports on the Atlantic coast of South America to selected ones on the Pacific coast, permitting cargo from Brazil to travel over land across the continent, thereby avoiding the need for shipping either around Cape Horn or through the Panama Canal, while also having potentially significant local development benefits along its route, especially in the Peruvian Amazon region.

The Peruvian section of the Interoceanica highway has several branches and has been divided into various segments for operational purposes, a number of which have already been improved as part of separate projects, including some intermediate sections in the Andean highlands with IDB financing.[78] Three concessions for other sections were awarded to private operators in 2005: (i) Urcos (near Cusco) to Inambari in Inambari District near Puerto

[75] For more on IIRSA and the IDB's specific role in it, see IDB/CAF/Fonplata, Comité de Coordinación Técnia, *IIRSA Agenda de Implementación Consensuada 2005-2010 – Informe de Evaluación – 31 Proyectos de Integración en América del Sur*, July 2010; IDB/CAF/Fonplata Comité de Coordinación Técnia, *IIRSA, Cartera de Proyectos 2010 – Planeamiento Territorial Indicativo, 2010,* and *IDB, Los Diez Años del BID en IIRSA 2000-2010,* Washington, D.C.

[76] Modeled on the European Union, UNASUR, or the Union of South American Nations, is an inter-governmental union integrating two existing customs unions, MERCOSUR and the Andean Community of Nations. It was formally constituted on May 23, 2008 at the third summit of South American heads of state in Brasília and its Constitutive Treaty entered into force on March 11, 2011.

[77] COSIPLAN is one of six thematic Councils created within UNASUR, the others being for defense, energy, health, social development, and drug-related issues. There are also inter-governmental working groups on financial integration and disputes settlement and a Board of Education, Culture, Science, Technology and Innovation.

[78] The Bank had previously agreed to finance the upgrading of two non-Amazonian segments of one major branch of the Interoceanica Highway-- between Puno, on Lake Titicaca, and Cuzco -- under two different loans, PE-L-0197 and PE-L-1006, and has possibly also benefited other areas within this corridor through PE-L-1011, for a national rural roads improvement project jointly financed with the World Bank.

Maldonado in the Amazon Basin, involving some 300 kilometers of previously unpaved roads; (ii) Inambari to Iñapari in Iñapari District on the Brazilian border opposite Assis Brasil in Acre, entailing 403 kilometers of previously unpaved roads; and (iii) Azangaro-Inambari, involving 306 kilometers of previously unpaved roads. These roads were leased to specialized Peruvian and Brazilian consortia of private companies.[79] The IDB is also financing border crossing improvements in Iñapari on the Acre River near Brazil (and in two other border crossing areas further south in Peru with Bolivia and Chile),[80] as well as some environmental mitigation measures and sustainable productive activities along the Amazonian portion of the Interoceanica Highway, although not the actual road construction and pavement themselves, which, as previously noted, were financed in part by a US$ 150 million loan from CAF, approved in 2006.[81]

The Bank-supported environmental project, which involves two parallel and interlinked grants – one from the Multi-lateral Investment Fund (MIF) and the other from the Italian Trust Fund for International Competitiveness (ICR) -- of US$ 1.5 million each, was approved in July 2008 and signed in February 2009. The executing agency is the Asociación Odebrecht Peru para el Desarrollo Sostenible y Conservación,[82] which is an offshoot of the large Brazilian construction firm that is a central part of the private consortium that has built and will operate this portion of the road under a 25 year concession from the Peruvian Government. The general

[79] The concession for the first two of these road segments was awarded to the same consortium led by Odebrecht of Brazil. Two other concessions further west between the coast and the highlands were awarded in 2007: (1) San Juan de Marcona on the Pacific Ocean to Nazca, Abancay, Cusco and Urcos, involving 763 kilometers of previously paved roads; and (2) branch 1 from Matarani on the Pacific Ocean to Arequipa, Juliaca (near Lake Titicaca between Peru and Bolivia) and Azangaro, and branch 2 from Ilo, also on the Pacific coast to Moquegua, Humajalso, Puente Gallatini, Puno and Juliaca, which together entail 752 kilometers of previously paved roads and 62 kilometers of previously unpaved ones.

[80] See Inter-American Development Bank, *Peru – Proyecto Paso de Frontera Desaguadero (Peru-Bolivia) y Componentes Transversales en el Marco del Programa "Pasos de Frontera Perú – IIRSA (PE-L-1003)* Propuesta de Préstamo, Washington, D.C., 2006

[81] See CAF's external website, which contains the following press release, *CAF Ortogó US$ 150 Millones al Perú para Los Tramos 2 y 3 del Corredor Vial Interoceánico Sur*, October 2, 2006. An earlier press release had mentioned a possible US$ 200 million CAF credit line for this project, see CAF, *CAF Ortogó US$ 260 Millones al Perú para el Corridor Multimodal Amazonas Norte y La Interoceánica Sur*, February 23, 2006. No information is provided, however, with respect to the environmental and social safeguards applied to this project.

[82] According to the Donors Memorandum, Inter-American Development Bank, *Peru – Integrating Conservancy and Sustainable Development in the Southern Interoceanic Highway Corridor (PE-M-1056/PE-T-1157) Donors Memorandum*, Washington D.C., Odebrecht Association "is a private nonprofit association created by Organización Odebrecht through Odebrecht Perú Ingeniería y Construcción S.A.C. and Odebrecht Perú Inversiones en Infraestructura S.A. to promote social development through sustainable initiatives to raise the quality of life and protect the environment" (pg. 8).

objective of this project, according to the respective Donor's Memorandum, is "to promote sustainable development and biodiversity conservation in the area of influence of the Southern Interoceanica Corridor, in order to improve the quality of life for the surrounding communities by identifying alternatives for job creation and income generation." The project's specific objective is "to develop sustainable production-oriented ventures adapted to the potential of the land and the population, thereby strengthening the capacity of local communities to manage the processes of change and development associated with the highway corridor." The area of influence of the highway corridor for purposes of the project is defined as the zone between two parallel lines 50 kilometers from the sections of the road between Urcos in the Department of Cuzco and Iñapari in the Department of Madre de Dios, which borders Brazil. While the 50 kilometer number is ultimately arbitrary, as this section of the road involves a total length of 703 kilometers, the "area of influence" covered by this corridor, so defined, is 70,300 square kilometers.[83] However, the actual indirect area of influence of the Highway – both in its Amazonian and Andean and coastal sections -- will ultimately depend on existing and new side – especially penetration and feeder – roads and is also likely to expand over time.

According to the Bank appraisal document, the project's area of influence "has one of the world's greatest concentrations of biodiversity, due to the good state of conservation and diversity of ecosystems due to the altitudinal gradient," and traverses the Vilcabamba-Amboró Biodiversity Conservation Corridor in the tropical Andes, which is characterized as "one of the world's biodiversity hotspots."[84] The corridor is also home to a large number of small farmer communities, with the section of the highway between Inambari and Iñapari also housing 30 indigenous communities, more than half of which were reportedly situated in the "project target area."[85] It is likewise an area of extensive poverty, as 90 percent of the roughly 120,000 people living in the corridor had an estimated average family income of just US$ 90, according to this source, which also observed that the local population was primarily engaged in "informal subsistence activities reliant on natural resources," mainly small-scale agriculture, logging, nut production, fishing, and gold mining. At the time the Bank project was appraised, the area was already witnessing substantial immigration, due in part to the "attraction of informal activities,"

[83] IDB, *Donors Memorandum*, op. cit., Executive Summary, pp. 1-2.
[84] Ibid., pg. 1. This Conservation corridor, more specifically, is a 30 million hectare area extending from the Vilcabamba mountain range in Peru to Amboró National Park in central Bolivia.
[85] Ibid., pg. 2.

and the Department of Madre de Dios was experiencing the highest annual population growth rate -- 3.1%, nearly twice the national average -- in all of Peru. Vehicle traffic had also grown significantly, already exceeding projections for 2009 -- and in some areas for 2015 -- by 2008,[86] and has undoubtedly increased even more now that the paved road has been completed.

The Donors Memorandum clearly recognizes the potentially significant direct and indirect impacts the Interoceanica Highway is likely to have both on the environment and on the resident and immigrant populations in its area of influence. In describing the "challenges and opportunities" associated with this major road improvement, this document affirms, for example, that:

> The main problem lies in the impact that an infrastructure project of the magnitude of the Peru-Brazil Southern Interoceanic Highway Corridor may have on an environmentally important area recognized for its biodiversity and on a population with low education levels living at minimum subsistence levels. The Corridor may also entail adverse indirect economic and social impacts from the roadway integration and presence of new actors (mining and extraction companies, merchants, and others)….Although the zone is protected under an environmental management system (protected areas, forest use licensing), land-use management is far from entrenched, and many current practices are environmentally unfriendly. The unprofitability of production-oriented activities and practices in communities surrounding the area leads them to engage in informal activities such as illegal logging and informal mining that seriously harm ecosystems.
>
> However, the construction of this large-scale infrastructure is also a significant opportunity for the region's development, and can have a positive impact on the quality of life for local populations. The first aspect to be noted, then, is the economic potential of this infrastructure if appropriate processes are implemented to integrate local populations into the opportunities for sustainable development that may be generated….A second aspect concerns land management in a context of weak capacity of local institutions combined with rapid changes in land use caused by the highway integration. For example, rates of deforestation are increasing considerably as a result of migratory flows into the region. The regions of Madre de Dios, Puno, and Cuzco are

[86] Ibid. pg. 1.

> insufficiently prepared politically, institutionally, and socially to mitigate the potential indirect adverse impacts of the improved highway corridor. At the same time, local institutions have limited capacity to promote the positive socioeconomic impacts that the highway could yield, and might unintentionally promote an informal extractive economy generating meager profits and high environmental impact.[87]

Thus, the area in which the project intervenes possesses all the aforementioned characteristics of a natural resource rich ecologically sensitive frontier region, while the potential direct and, especially, indirect environmental and social impacts of the road improvement are expected to be similar to those outlined above for the other cases reviewed. The proposed Bank project is seeking to help address some of these impacts. The corresponding Donors Memorandum also affirmed (in a footnote) that land-use management issues along the road corridor were being addressed by an "Indirect Impact Mitigation Program," financed by CAF with co-financing by the Peruvian Government and executed by the National Institute of Natural Resources (INRENA). The Bank operation was designed to complement this initiative by strengthening local organizations. However, no other information is provided with respect to the CAF-supported mitigation program, so it is not possible to comment on the adequacy of its design or implementation. The ongoing Bank project nevertheless has components for: (i) strengthening local governance; (ii) developing sustainable production-oriented activities; (iii) sustainable biodiversity conservation management; and (iv) monitoring, lessons learned, and dissemination. The project coordination unit is based in Lima, there are local project offices in the region at two localities, and the proposed execution and disbursement period is 48 months.

In the case of the Interoceanica, in short, the Bank grants are intended to help address some of the potential adverse environmental and social impacts of a major road improvement project in the Amazonian portion of an important international integration corridor whose road investments were financed by another source. But both the scope and scale of these impacts[88]

[87] Ibid, pp. 2-3. Emphasis in the original. The document also observes, however, that "there is a wealth of community and civil society organizations involved in environmental matters and social development, particularly in the high Andes region, including producers associations and NGOs."

[88] See Babbitt, op. cit. and Stephen L. Kass, *Assessing South America's 'Interoceanica" Highway*, New York Law Journal, August 28, 2009. For a more general analysis of the sustainable development challenges facing the Peruvian Amazon in light of recent and planning road and other infrastructure investments, see Marc Dourojeanni, Alberto Barandiarán, and Diego Dourojeanni, *Amazonia Peruana en 2021 - Explotación de recursos naturals e*

and the measures needed to effectively manage, monitor, mitigate and/or compensate for them go way beyond what the Bank is doing at present, with responsibility for these actions falling primarily on the Peruvian Government, CAF, and the road concessionaire itself. Presumably, however, because of its involvement in biodiversity conservation and sustainable production support activities in the most sensitive part of the corridor, the Bank is – or at least should be – carefully monitoring what is happening there, perhaps with an eye to expanded support in the future, now that the paved road is in full operation.

6. IIRSA Norte

A somewhat similar situation exists with respect to the IIRSA Norte road, whose improvement is also being financed by CAF through a loan approved in February 2006[89] and is being built and will be operated by a consortium led the same large Brazilian private construction company. However, there is also a significant difference in that, as the IDB is providing a US$ 60 million partial credit risk Guarantee, given the possibility that it could be converted into a loan, the Recipient bears the same responsibility with respect to the application of Bank environmental and social safeguard policies as it would if it were the Borrower in a regular Bank lending operation. Thus, unlike the situation described above with respect to the Interoceanica,[90] the Peruvian Government had to follow prevailing Bank safeguard requirements and procedures[91] in addition to its own prevailing national legal obligations in preparing the IIRSA Norte project, and the Bank is also directly accompanying project implementation through periodic supervision missions.

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infraestructuras: Que está passando? Que es lo que significan para el futuro? Pronaturaleza – Fundación Peruana para la Conservación de la Naturaleza, Lima, 2009.

[89] See footnote 80 above.

[90] In this case, in the understanding of Bank staff familiar with CAF, only prevailing Peruvian environmental assessment and licensing procedures at the time needed to be followed, as CAF's policy with respect to environmental and social safeguards is to rely on national requirements, which are normally less comprehensive than those of the IDB and other multilateral banks, especially with regard to stakeholder consultation and public disclosure, but also with regard to the circumstances under which Strategic Environmental Assessments (SEAs) in addition to more traditional (and limited in scope) project-specific EIAs would be needed.

[91] It should be noted, however, that as this Guarantee was approved in early 2006, this was before the Bank's current Environment and Safeguards Compliance policy went into effect, which, while formally approved by the Board in January of that year, only began to apply to operations entering the pipeline starting in July 2006.

According to the Bank's Guarantee Proposal (GP), also approved in February 2006, the general objective of this program is "to support the Government of Peru in implementing infrastructure projects using innovative financing arrangements, through support for the [IIRSA] Northern Amazon Hub project, by providing a guarantee for the government's payment commitments to the concessionaire," noting further that the Government had granted a concession to the private sector to rehabilitate and maintain a 960 kilometer road for a 25 year period."[92] The IDB's Guarantee, in turn, would be for up to 20 years, being convertible into an ordinary capital loan to the Peruvian Government if needed.

Among the special contractual conditions identified in the Project Summary was that, prior to first disbursement should the Guarantee be converted into a loan: (a) the concessionaire must have completed the works envisaged for each stage and fulfilled during the construction stage the social and environmental commitments established in the concession agreement; and (b) it must be demonstrated that the MTC [Ministry of Transportation and Communication] has made progress in implementing the programs accorded priority in the strategic environmental assessment, including the drafting of an agreement with INRENA.[93] It is also affirmed that "should the concession be terminated early, the guarantee will cover partial payment of the corresponding annual payment for construction, provided the social and environmental commitments set out in the concession agreement during the construction phase were met." It is noteworthy, however, that no mention is made of the "operation" (i.e., post-construction) phase of the project in these conditions, nor is there any indication as to what, more precisely, these "social and environmental commitments" consisted in, who would verify whether they have indeed been met, and/or how this would be done. Furthermore, only the "special condition" that the MTC is "advancing in the implementation of the priority programs of the SEA" is actually contained in the Guarantee Contract signed between the Bank and the Government, with there being no reference to the social and environmental commitments contained in the concession agreement in this regard.[94]

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[92] IDB, *Peru – Guarantee Program for the IIRSA* Northern *Amazon Hub (PE-L-1010) – Guarantee Proposal,* Project Summary.
[93] Ibid., Project summary.
[94] See IDB, *Contrato de Garantía y Contrgarantía No. 1717/OC-PE entre la República del Perú y el Banco Interamericano de Desarrollo – Programa de Garantías Ramal Amazonas Norte IIRSA*, July 19, 2006, Clausula 2.03, Condiciones especiales previas a los desembolsos de la garantía, pg. 8.

The GP justifies Bank support for IIRSA Norte by observing that "the present operation is a strategic project in the Amazon hub, where east-west connections between the Andean countries (Colombia, Ecuador, Peru) and Brazil can be promoted by completing missing stretches of road and developing inland navigation." It also affirms that "the Bank is supporting those connections that have the lowest impact. For example, in the Northern Amazon corridor the focus is on upgrading an existing road that leads to where a waterway connection will exist in the future, thereby promoting transportation solutions consistent with the characteristics of the region." And it states that "the IDB guarantee complements the facility that the CAF has approved for the concessionaire…[which] provides financing during the construction phase, while the IDB guarantee provides credit enhancement during the post-construction phase" and argues that "together, the two open up the possibility of attracting domestic and/or international resources to the program."[95]

Expected to be carried out over four years and involving estimated investments of nearly US$ 220.5 million, a more specific description of the project, as presented in the IDB GP, is as follows:

> The objective of the project…is to foster economic integration between the port of Paita on the Pacific, the city of Piura, and the river port of Yurimaguas on the Huallaga River, which, in turn, connects with the Amazon River. This will promote the establishment of new production centers and boost intra- and inter-regional trade by lowering transportation costs….The works consist of improving and rehabilitating existing stretches of road, protecting existing works against natural disasters, and building and rehabilitating bridges, by means of a PPP [Public-Private Partnership] arrangement. Currently, about 90% of the corridor is paved but requires patching and resurfacing of the top course, and paving of the last stretch. This involves preventive works against natural disasters, such as culverts, bank stabilization, protection works, and bridge rehabilitation and construction. The condition of the wearing course and banks between Tarapoto and Yurimaguas makes that stretch the most critical.[96]

The GP also describes what is referred to as the "project risk distribution," which is prefaced by the statement that "the main risks are assumed by the parties, in accordance with

[95]IDB, Guarantee Proposal, op. cit., pp. 2-4.
[96] Ibid., pg. 6. My emphasis.

their capacity to mitigate them, bearing in mind that this is both a long and a large project that runs through complex areas such as the Peruvian coast, highlands, and jungle, which have difficult climates, high rainfall risk, and geological and seismic problems."[97] It then identifies specific construction, operation and maintenance, financing, early termination, commercial, natural disaster and El Niño-related, other environmental, and macroeconomic risks, observing in the case of the "environmental" ones that "the concessionaire is bound under the contract to mitigate the environmental and social risks directly associated with both the project's construction phase and its operation and maintenance phase."[98] However, no specific "social" risks are identified and, as noted above, no reference to social and environmental commitments on the part of the concessionaire -- or the Peruvian Government -- during the operation and maintenance phase of the project is contained in the Bank's Guarantee Contract.

The GP likewise contains a section on the project's "environmental impact," according to which:

> A Strategic Environmental Assessment (SEA) has been conducted for the corridor and its area of influence, and the different stretches have individual environmental impact assessments (EIAs). To do this (sic), the following actions were taken: (i) review and reformulation of environmental impact assessments, (ii) review and formulation of a Strategic Environmental Assessment, (iii) review of the design to be used as a reference for minimizing adverse impact on the environment, (iv) greater weight given to socio-environmental considerations when ranking bidders in the competition for the concession, (v) inclusion in the concession contract of requirements to prevent and mitigate socio-environmental impacts, and (vi) inclusion of conditions precedent to the entry into force of the guarantee regarding compliance with the Bank's environmental and social policies.[99]

Seemingly overlooking the need to resurface and pave some 10% of the road, most likely in the "jungle" section of the corridor, the GP goes on to state that "potential adverse

[97] Ibid., pg. 11. My emphasis.
[98] Ibid., pg. 13. With respect to risks associated with natural disasters and El Niño, in turn, the document affirms that "to address the risks of natural disasters, earthquakes, floods, rain, fire, explosions, and other catastrophes, the concessionaire must take out an insurance policy against all risks for the full replacement value of the goods and works covered by the concession contract."
[99] Ibid., pg. 26.

environmental and social impacts of the operation range from moderate to low because the program involves works to rehabilitate and improve an existing roadway and recover critical areas affected by El Niño, and does not involve opening up new roads, expanding existing roads, or building bypasses." Affirming that "the concession contract includes the environmental management plans for the construction and operation phases, as well as fines and penalties for noncompliance during the operation phase," without, however, indicating more specifically what these consist of, it then goes on to identify potential direct impacts during both the construction[100] and subsequent operation[101] phases, as well as indirect ones, reiterating in the case of the latter – and again overlooking the section to be paved -- that:

> moderate to low impacts are expected, given that most of the works to be undertaken consist of building protection works and drainage systems, improving the wearing course, and rehabilitating bridges on an existing road. The following impacts were identified in the SEA: (i) possible increase in the cultivation of illegal crops; (ii) land use changes from agricultural to commercial and residential; (iii) possible illegal activity in forest areas for farming activities; and (iv) possible impact on local cultural patterns and possible migration of local inhabitants to cities. Indirect impacts have been classified as moderate to low because it was determined that no indigenous reservations or areas vulnerable to deforestation exist within the area of indirect influence with access by land to the feeder roads.[102]

The GP, however, does not elaborate on any of these potential impacts reportedly identified by the SEA, how likely they were, or even indicate how the area of indirect influence

[100] During the construction stage, direct impacts were expected to include: (i) soil erosion and landscape degradation, with possible sedimentation of nearby water bodies; (ii) soil and water pollution caused by waste and effluents produced in the work areas; (iii) risk of landslides and collapses in unstable areas due to earth movements; (iv) landscape degradation and contamination of water bodies due to inadequate waste and debris disposal; (v) river and stream bed intervention; (vi) accidental rupture of pipes or public utility lines, and temporary interruption of services in urban areas; (vii) generation of noise, gas, and dust; (viii) traffic congestion and temporary blocked access to dwellings and businesses in populated areas; (ix) dangerous driving conditions while works are under way; and (x) risks to workers of occupational diseases and accidents. Ibid., pp. 26-27.

[101] Specifically, (i) risk of hazardous materials spills; (ii) increased road accidents; and (iii) increased noise and emissions pollution. (Ibid., pg. 27)

[102] Ibid., pg 28. My emphasis. It goes on to state that "in the La Escalera highland protection forest, located in the area of direct influence, no problems exist of illegal extraction of lumber or fauna, or of illegal settlements, and according to the analysis these problems are not expected to arise" and that "most of the impacts identified are being addressed by the USAID Poverty Reduction and Alleviation Project, which is a comprehensive program being implemented in the area to replace illegal crops and reduce poverty, while also providing infrastructure in the region."

of the project was determined or what it includes, although all of this was given specific attention in the SEA (see the next section). In addition, it immediately seems to contradict itself with respect to presence of indigenous peoples in the road's area of influence by stating just two paragraphs later that "there are no indigenous communities in the project's area of direct influence, although some live in its area of indirect influence, nor are there other potentially vulnerable communities such as Afro-descendant groups." It also affirms that indigenous communities were consulted during preparation of the SEA, "which identified impacts on indigenous communities including loss of cultural identity and inadequate land use and land tenure, which will be moderate to low in impact."[103]

Finally, the GP argues that the IIRSA Norte project will have a "significant positive impact," which is described predominantly in physical and economic terms:

> The principal project benefits are that Peru's competitiveness will be increased, it will integrate remote regions of the country, and it will contribute to road integration with IIRSA countries. These benefits will result from the improved transportation conditions for people, for national freight transport, and for foreign trade. The project seeks to reduce transportation costs and travel time, and to improve road safety….The improvement of transportation conditions in the Northern Amazon Hub will have a positive impact on the value chain of Peru's agricultural and industrial sectors, and will have a multiplier effect on other competitiveness factors, such as improved access of nearby production and service centers to human and natural resources. Road safety conditions for users will be improved because the concessionaire is under the obligation to maintain the road at established service levels….[I]ts impact on economic growth will contribute to the goals of the poverty reduction strategy. The project benefits urban populations and promotes industrial and agricultural development in the project's area of influence. It will also make it possible to bring isolated areas in the area of influence of the Huallagas and Amazon rivers into the rest of the Peruvian economy, promoting sustainable industries such as ecotourism.[104]

[103] Ibid., pg. 29. My emphasis. It also observes that the SEA "identifies a number of development programs that involve the indigenous communities" and that "implementation of the plans will be on the agenda for the dialogue on the environmental assessment to be held by the Bank in Peru in 2005," but does not further clarify what this means.

[104] Ibid., pp. 30-31. My emphasis.

However, the GP does not identify or address the potential adverse environmental and social impacts associated with the project's indirect role in improving access to natural resources and promoting "industrial and agricultural development in its area of influence" or as a result of bringing "isolated areas in the area of influence of the Huallaga and Amazon rivers into the rest of the Peruvian economy," other than to mention "sustainable industries such as ecotourism." Thus, there is a significant mismatch or "disconnect" in the document between the expected indirect economic benefits of the project and its potential indirect environmental and social costs in its larger area of influence, which presumably includes the "isolated areas" referred to above, together with other areas along the road corridor as a whole.

In this context, the GP does mention that "an environmental and social management plan was agreed to for addressing the impacts [identified by the EIAs and SEA], which includes actions to ensure timely and effective implementation of measures to prevent, mitigate, and compensate for these impacts as a contractual obligation of the concessionaire, who must cover the cost of same. In addition, measures to prevent and mitigate the principal indirect impacts identified were accorded priority." It observed further that:

> To mitigate indirect environmental impacts, a social and environmental management plan was designed with the following priority, higher impact programs: (i) communication and dissemination; (ii) institution-strengthening; (iii) environmental monitoring; and (iv) strengthening the control system for the traffic in lumber, illegal crops, and hazardous materials. The measures the concessionaire must take to mitigate these effects include building police posts and providing public services and communications facilities in the corridor. This will considerably improve the control of traffic in lumber, protected flora and fauna, hazardous materials, and illegal crops. Before the guarantee can become effective, the MTC must sign an agreement with the National Institute of Natural Resources (INRENA) to ensure adequate control of the toll booths. The overall management of deforestation prevention programs, protected area programs, and land use programs will be addressed through the environmental assessment of Peru, to be performed by the Bank in 2005.[105]

[105] Ibid., pp. 28-29. My emphasis.

However, it is unclear what "the environmental assessment of Peru, to be performed by the Bank in 2005," in fact refers to in relation to the "overall management of deforestation prevention programs, protected area programs, and land use programs" -- or even what these programs are -- that were reportedly to be addressed by this assessment, nor what would happen following this exercise. It is also curious that, for an operation that was presented to the IDB Board in February 2006, the Guarantee Proposal refers in future terms to an event "to be performed by the Bank in 2005" without stating whether this event had, in fact, occurred, and, if so, what its results were. It is clear, however, that, in the absence of well-designed and well-implemented environmental and social management and protection programs in the road's larger area of influence, the potential indirect environmental and social impacts of the IIRSA Norte project cannot be effectively addressed, and certainly not by the road concessionaire alone. Furthermore, based on what is stated in the Guarantee Proposal, even if the project's own reported environmental and social management plans are well-implemented, carefully monitored, and properly supervised by CAF and IDB, they do not appear to do this. In short, improved communication and dissemination, institution-strengthening, environmental monitoring, and enhanced control systems for the traffic in lumber, illegal crops and hazardous materials, important as they undoubtedly are, are far from sufficient to avoid, minimize or control the potentially substantial induced development effects and their likely adverse environmental and social consequences associated with the IIRSA Norte road improvements in its larger area of influence however defined, and these potential impacts appear to have been largely overlooked by the Bank in setting up the Guarantee.

7. The Pasto-Mocoa Alternate Road Project

With a US$ 53 million loan approved in December 2009, this is the most recent of the major Bank-supported road improvement projects reviewed in this study. As such, its implementation has only recently begun as the corresponding Bank loan just became effective in mid-2011. However, its rationale and design bears some important similarities with earlier such operations, including its link to IIRSA, as part of the eventual Tumaco (a port on the Pacific coast of Colombia) to Belém do Pará (a port near the mouth of the Amazon River in eastern Brazil) intermodal road and river transport corridor. It is also similar to some of the earlier operations with respect to the application of the Bank's requirement -- but now under the current

environment and safeguards compliance policy (OP-703), approved in January 2006 and made effective for all new projects entering the Bank's pipeline as of July of that year[106] -- that an improved EIA and parallel SEA be undertaken as part of project preparation and that environmental and indigenous peoples' protection measures be built into the project itself. It is also noteworthy that Bank interventions were responsible for considerable improvements in the engineering design of the new alternate road between the cities of San Francisco and Mocoa from an environmental standpoint. As in the case of the Santa Cruz-Puerto Suaréz Corridor program, moreover, these up-front environmental assessments and road engineering design alterations were financed by a (US$ 1.45 million) Bank Technical Cooperation grant, approved in November 2006,[107] while other aspects of project preparation were likewise funded by Bank TCs (for US$ 145,000 and US$ 100,000, respectively), specifically for conservation and development in high biodiversity areas along the alternate road corridor, approved in May 2008,[108] and to assist indigenous communities in the Sibundoy Valley to develop a small enterprise to supply construction materials for the road, approved in October 2008.

According to the Bank Loan Proposal for the main project, its objective is "to improve the efficiency and safety of the Tumaco-Pasto-Mocoa road corridor, promoting the physical and economic integration of southern Colombia with the country's main production and consumption centers, while seeking to conserve its ecosystems and promote sustainable economic and social development. With this aim, the project will finance construction of the 45.6 km San Francisco-Mocoa bypass road and the social and environmental mitigation and compensation measures required for execution and operation of the project."[109] The LP provides additional background information with respect to this project, reaffirming that this road "will aid international

[106] See Inter-American Development Bank, *Environment and Safeguards Compliance Policy*, Sustainable Development Department, Environment Division, Sector Strategy and Policy Papers Series, Washington D.C., March 2006 and Inter-American Development Bank, *Implementation Guidelines for the Environment and Safeguards Policy*, Sustainable Development Department, Environment Division, Sector Strategy and Policy Paper Series, Washington D.C., May 2007.

[107] Inter-American Development Bank, *Perfil de Cooperación Tecnica – Preparación del Programa de Infraestructura Regional – Corredor Vial Pasto-Mocoa (CO-T-1038)*, Washington D.C., July 24, 2006.

[108] Inter-American Development Bank, *Colombia: Conservation and Development in High Biodiversity Areas – Pasto Mocoa Road Project (CO-T-1142) Technical Cooperation Program (Trust Fund Financing) TC/FUNDS Brief*, April 2008.

[109] IDB, *Colombia – San Francisco-Mocoa Alternate Road Construction Project – Phase I (CO-L-1019)*, Washington D.D., December 17, 2009, Project Summary, pg. 1. My emphasis.

transportation between Colombia and Ecuador through the Andean Integration Hub[110] and facilitate the connection with Brazil through the Multimodal Amazon Hub," both of which are parts of IIRSA.[111] The road is also identified in the national development plan for 2006-2010 as "one of the complementary arterial corridors that is a key contributor to the increased competiveness and productivity of Colombia." The LP notes further that:

> The Tumaco-Pasto-Mocoa corridor has several sections. INVIAS [the National Highway Institute, which is the project implementing agency] is paving the section between Tumaco, Pasto (capital of the department of Nariño), and San Francisco. There are serious traffic restrictions on the section of the road (78 km) between San Francisco and Mocoa (capital of Putumayo) built in the 1930s, which has long 4-meter wide stretches, where only one vehicle can pass, high gradients, unstable areas, constant cloudiness, and sharp cliffs, making this one of the roads with the highest accident rate in the country. This uncertain accessibility and connectivity has resulted in serious limitations to the development of profitable and productive alternatives, and a primary sector that is not very competitive, and has contributed to the high level of pervasive poverty in the region.
>
> Rehabilitation of the San Francisco-Mocoa section using the same route would be very costly and environmentally inappropriate, resulting in the need to build a 46.5 km alternate route. The proposed route would be located in the Amazon foothills, and 68% of the route would cross through the Protected Forest Reserve of the Upper Mocoa River Basin (RFPCARM), which is administered by Corpoamazonía (the competent environmental authority)…The proposed route would skirt some of a Camino Real used as an overland route by the Andean and Amazonian indigenous communities since ancestral times. While there are no indigenous communities in the area of the alternate road, they have a close socio-cultural relationship with the forest reserve. Because of its environmentally sensitive location, the design of the alternate route was optimized to minimize its environmental impacts and the construction works are complemented with

[110] According to IDB, *A New Continent….* op. cit., (pg. 19) this Hub or axis "comprehends connections (networks of trunk roads, ports, airports and border crossings) in Bolivia, Colombia, Ecuador, Peru and Venezuela. It includes 11 groups of projects, many of which are related to the Panamerican Highway and the Marginal de la Selva road, which connects the Andes in Venezuela to the Amazon Basin in Colombia, Ecuador and Peru."

[111] My emphasis. According to Bank staff familiar with the project, however, the latter is only likely to happen over the long-term, as considerable (and costly) navigation improvements will reportedly be required on local rivers flowing into the larger Amazon River before this intermodal transport corridor can become an effective reality.

the PMASIS [The Integrated and Sustainable Environmental and Social Management Plan – see below] as a project component.[112]

In describing the rationale for IDB participation, the LP states that the Bank had approved non-reimbursable technical cooperation "operations totaling close to US$ 1.7 million, providing INVIAS with technical and financial support to: (i) establish a broad and integrated process of discussion and participation with communities, indigenous populations, nongovernmental organizations (NGOs), public agencies, and private stakeholders; (ii) carry out technical and social and environmental studies that permitted an assessment of the project's implications from an international, national, regional, and local perspective, and an analysis of the synergy with other development activities envisaged for the region, in addition to identifying the direct impacts resulting from its construction and operation; (iii) propose a broad impact mitigation and compensation plan that, in addition to managing the impacts of the works, will enable the project to promote conservation of regional ecosystems; and (iv) establish an institutional agreement with organizations responsible for implementing that plan."[113]

The LP also affirms that the project would "provide benefits to the users of the road corridor and those living in the departments of Nariño and Putumayo. Construction of the by-pass road and improvement of the remaining sections of the Tumaco-Pasto-Mocoa corridor, associated with completion of the rehabilitation works on the border crossing between Colombia and Ecuador on the San Miguel bridge and paving of the Mocoa access road to that crossing, already being executed by INVIAS, will create a new transportation alternative that will permit savings of nearly 13% in the cost of transportation per ton." In addition, the proposed new bypass road was expected to significantly improve road safety, shorten the Pasto-Mocoa-Bogotá route (from 800 to 730 kilometers), and diminish travel time accordingly "making the road serviceable for the transportation of agricultural goods from the two departments to the country's main consumption and export centers and contributing to its socio-economic development."[114] Thus, project benefits would appear to be significant, affecting, at a minimum, the southern Colombian departments of Nariño and Putumayo, and, thus, having an impact well beyond the immediate area of influence of the new road section to be constructed.

[112] Ibid., pp. 1-2. My emphasis.
[113] Ibid., pg. 3.
[114] Ibid., pp. 3-4.

The project, as designed, is also hoped to generate significant environmental benefits. According to the LP, its "sustainable regional integration framework will promote conservation of the region's protected areas through better land use, the social and productive development of the communities in its area of influence, and control over the spreading of the inappropriate use of natural resources." The LP likewise affirms that "ending the historical isolation and strengthening local governance under the project will help to improve the defense of property rights of the region's population." Finally, it clarifies the proposed phasing of road construction activities, stating that:

> INVIAS has divided the construction of the alternate road into two phases: (i) the first phase to be financed under the present loan costs US$ 203 million and will permit the alternate route to be built with a wearing surface and put in service in full operational and safe condition; social and environmental measures come with this phase; and (ii) the second phase (US$ 60 million), to be financed with resources from the Colombian government will include the asphalt paving of the alternate road; phase II is not part of the present operation. The division into phases is due to restrictions on future budget appropriations and the high cost of the works.[115]

The project has two components: (i) civil works and inspection (US$ 191.1 million, of which the Bank loan was expected to finance 21.5%, including 20.7% of the direct construction costs estimated at nearly US$ 176.9 million[116]); and (ii) the Integrated and Sustainable Environmental and Social Management Plan (PMASIS) for the Mocoa River Protected-Productive Forest Reserve (RFPPRM) (US$ 11.4 million, to be fully financed by the Bank loan). According to the LP, the first component consists of three parts: (i) construction of 45.6 kilometers of surfaced road (Phase I), acquisition of the right-of-way areas required to execute the project and measures to mitigate the direct impacts of these works; (ii) inspection and supervision of these works; and (iii) project management by INVIAS, including mid-term and final evaluations. The project's Environment and Social Management Report (ESMR) reportedly also contains "a program for management of families living in the right of way in accordance

[115] Ibid., pg. 4.
[116] Ibid., pg. 7. These costs include direct environmental mitigation of the works and land acquisition, among other items. Detailed cost figures for works, "goods," including land acquisition, and consulting services are presented in an annex to the Loan Proposal.

with OP 7.10," the Bank's involuntary resettlement policy.[117] The LP likewise affirms that the PMASIS component "adds to the project's biodiversity protection, management, and conservation activities in the Protected Forest Reserve in the Upper Basin of the Rio Mocoa and the surrounding areas in compliance with Directive B.9 of the Environment and Safeguards Compliance Policy (OP-703) with the result that the alternate road does not degrade or significantly alter critical native habitats in the project area."[118]

The LP then identifies the "overarching strategies" of the "PMASIS programs and projects," more specifically: (i) environmental land use; (ii) conservation and sustainable development; (iii) relationship of communities to conservation of the protected areas; (iv) sustainable conservation of the alternate road; and (v) operation, monitoring and supervision. Elsewhere, it affirms that PMASIS "should become a social and environmental management instrument of INVIAS and the competent environmental authority for the Reserve," noting further that, for this purpose, it had "the backing of the departmental, municipal, police, military, and national park authorities who signed an institutional agreement in May 2009 to support [its] implementation, and the MAVDT [Ministry of Environment, Housing and Territorial Development], which included it as part of the obligations for the environmental permit for the road." The project document also elaborates on the supervision, monitoring and oversight arrangements for PMASIS.[119]

These precautions and the project design are laudable as far as they go. However, the LP could also have spelled out how eventual encroachments and/or the unauthorized deforestation in and/or illegal extraction of flora and fauna from the Forest Reserve, should they occur, would be addressed, how other environmental regulations and/or restrictions would be enforced, and with what consequences for offenders. More generally, the LP would have benefitted from inclusion of one or more maps showing where the RFPPRM and each of its component parts mentioned in

[117] Ibid., pg. 4.
[118] Ibid.. pg. 5. Directive B.9 of OP-703, which went into effect in July 2006, specifically states "The Bank will not support operations that, in its opinion, significantly convert or degrade critical natural habitats or that damage critical cultural sites. Whenever feasible, Bank-financed operations and activities will be sited on lands already converted. In addition, the Bank will not support operations involving the significant conversion or degradation of natural habitats as defined in this policy, unless: (i) there are no feasible alternatives acceptable to the Bank; (ii) comprehensive analysis demonstrates that overall benefits from the operation substantially outweigh the environmental costs; and (iii) mitigation and compensation measures acceptable to the Bank – including, as appropriate, minimizing habitat loss and establishing and maintaining an ecologically similar protected area that is adequately funded, implemented and monitored…."
[119] Ibid., pp. 9-10.

the text -- i.e., the existing Mocoa River Protected Forest Reserve, the area proposed to be added to it, the new Protected-Productive Forest Reserve, and the Mocoa Integrated Management District (DMI), as well as the biological conservation corridor connecting the southern extent of the Colombia massif with northern Amazonia, all of which have different areas -- are or will be located in relation to the alternate road itself. In addition, while the LP affirms that "the social and environmental sustainability guaranteed by PMASIS will result in an increase in protected areas and greater conservation of local biodiversity" as well as that, "in the medium term, results are expected to be obtained in growth in economic activity, diversification, and expansion of production, improvement in protection of the right of way of the local population, and poverty reduction,"[120] the project document provides insufficient information as to how the broader potential indirect environmental and social impacts of the road in its larger area of influence in Nariño and Putumayo and, indeed, along the entire Pasto-Mocoa corridor, would be addressed, as required under the Bank's Environmental and Safeguards Compliance Policy.

One general lesson that can be drawn from the design and preparation of this project – as well as from the others briefly reviewed above – therefore, is that Bank project documents, especially Loan Proposals, should provide greater information about the associated environmental and social management arrangements, including maps of the affected areas. In the present case, a more detailed description of the second component of the alternate road project, PMASIS, is presented in an annex containing the Environmental and Social Management Report (ESMR), but its contents should also be spelled out in greater detail in the main text of the Loan Proposal itself.[121] A second, and ultimately, more important lesson, which has likewise been drawn in connection with some of the other Bank-supported operations reviewed above, is the need to fully align project direct and indirect (economic) and (environmental and social) costs in a spatial sense. In short, the Pasto-Mocoa project document is not alone in claiming that a major road improvement will have significant, if indirect, regional (and national) economic benefits, as the result of the reduced transport costs and increased access to rural land and other natural

[120] Ibid., pg. 7.

[121] In this case, the ESMR summarizes – and, thus, provides only an overview of -- the results of three other studies, which are also available electronically in the project file through the Bank's website, but in the case of one of these at least, the Regional Environmental Assessment (REA), only the summary of is presented and not the full study. Presumably, the full report or reports are available at the Bank's Public Information Center, or at least should be if it/they are not.

resources that it will make possible. However, possible associated indirect environmental and social costs, especially those due to induced development and cumulative impacts, are generally not well identified or assessed. And as observed earlier in this report, these benefits and costs are rarely, if ever, quantified and compared ex-ante. Nor does the Bank, in its PCRs, attempt to evaluate them, or even the direct project benefits and costs, *ex-post*, once the actual implementation period and costs, which often turn out to be considerably greater than those estimated at the time of appraisal, are known. Third, as will be discussed in further detail in the next section, even while, over the past decade, the Bank has required – and provided financial and technical assistance to help — Borrowers to undertake Strategic Environmental Assessments (SEAs) and/or improve existing EIAs in order to meet IDB requirements for major road improvement operations in frontier areas, the results of these assessments, especially as regards their potential indirect environmental and social impacts, have not always been fully taken into account in designing actual project environmental and social management and protection plans.

E. Project Environmental and Social Assessments and Associated Management Plans

This section will briefly review the evolution of the Bank's approach to environmental and social assessment as part of the project preparation process, as illustrated by the various road improvement or road-related projects whose general pre-approval activities and design were discussed above. In doing so, it will highlight both examples of "good practice" and areas where further improvement would be useful in the context of similar such projects, including those for other types of large and international integration-related infrastructure investments, particularly in frontier regions such as the multi-country Amazon Basin. Relevant lessons from this experience will also be drawn.

1. The Porto Velho-Rio Branco Road Project

As observed above, no up-front environment impact assessment was undertaken for the Porto Velho-Rio Branco road project, as this was not yet a requirement either under Brazilian law or by the IDB at the time this operation was prepared in the mid-1980s. However, to its credit, the Bank did clearly recognize the potentially significant direct and indirect environmental and social impacts that pavement of this section of the BR-364 highway could

have, and included specific measures in the project, through what became known as the PMACI component, to better diagnose and seek to mitigate these effects, although, as has tended to be the case in subsequent Bank-financed road improvement operations, "social" impacts referred mainly to those on indigenous communities rather than on other potentially vulnerable low-income populations that could also be adversely affected by the induced development consequences associated with the road investments.

2. Darién Sustainable Development Project

The Loan Proposal for this operation mentions an "Environmental and Social Impact Report" (ESIR), which presumably was the result of some kind of environmental and social impact assessment. However, this assessment *per se*, and any associated public consultation and disclosure process, is not described, nor does the LP provide any detailed information about it. This notwithstanding, at the time of appraisal, the Bank was clearly aware of the project's potential risks in this regard and it put forward a pioneering approach to environmental and social management, including numerous relevant components and subcomponents, as well as the aforementioned "Environmental and Social Sequencing Matrix." As concerned project social and environmental risks, for example, the LP affirmed:

> The recommended operation implies risks of both a socio-cultural and an environmental nature. This reflects the difficulty of implementing actions to supervise areas where the demand for conservation is still very recent. Nevertheless, in the technical opinion of the project team, the risks of not proceeding with the program are even greater. This operation provides an opportunity to achieve important progress, in terms of both conservation and the living standards of the inhabitants of Darién….The feasibility and success of the program will depend to a large measure on compliance with the Strategic Plan and Environmental and Social Sequencing Matrix which establishes the steps needed to avoid the negative impacts identified in the Environment and Social Impact Report (ESIR). These actions, such as demarcating protected areas and indigenous reservations, land surveys and title certification, and resolving landholding conflicts through consensus-building conflict resolution negotiation fora, are fundamental to the success of the program. The sequencing approach makes it possible to define steps that must be met prior to bidding together with the performance indicators and verification

methods for each stretch of the highway or other works identified as having highly negative impact. The matrix will be a key part of the program operating regulations, and will be a condition for preparing the annual operating plans.[122]

However, it would have been useful had the LP provided greater information about the precise nature of these risks as well as with respect to the findings and recommendations of the ESIR both in the form of a summary in the main text of the document and in further detail in a specific environmental and social management annex. The Loan Proposal, however, does present a summary of the Environmental and Social Sequencing Matrix in an annex for each of the three project "work fronts" and the various "sub-zones" within each one, as well as the institutional responsibilities for carrying them out, expected outputs or outcomes, and the proposed means of verification. But this annex is quite sketchy and the specific timing of the numerous activities it contains is unclear.[123] This annex also sought to identify both "actions to mitigate negative impacts" and "actions with possible negative impacts" but, as no further explanation is given, this is likewise unclear. While clarifying details may have been provided in other project documents, the LP itself could have provided further information in this regard.

3. The Acre Sustainable Development Project

Under national law at the time this project was prepared, an environmental impact assessment and associated environmental impact report (known in Brazil as an EIA-RIMA) were required for the proposed new major road improvement along the BR-364 in Acre. Initially, this was undertaken by a consulting firm in September 1996 for pavement of 217.7 kilometers of this highway between Tarauacá on the banks of the Tarauacá River and Rodrigues Alves on the banks of the Juruá River.[124] At the Bank's request, the State of Acre updated this assessment for pavement of 101.5 kilometers of the road (out of the larger segment considered in the EIA-

[122] Inter-American Development Bank, *Panama – Darien Sustainable Development Program (PN-0016)*, project document, op. cit. pp. 38-39. My emphasis.

[123] Ibid. To its credit, the LP also contains separate annexes with the "Strategic Plan of the Darién Sustainable Development Project" which summarizes proposed activities in each of the "work fronts" on a semester by semester basis for the expected five year implementation period, as well as the project's "logical framework" complete with performance indicators for each of the project's main activities. However, exactly how the Environmental and Social Sequencing Matrix was expected to fit into them is not very clear.

[124] STCP Engenharia de Projetos Ltda, EIA-RIMA, *Pavimentação da BR-396 Trecho entre Rodrigues Alves e Tarauacá*, Curitiba, Paraná, Setembro 1996. The EIA is in four volumes and the RIMA, which summarizes it, is in a fifth.

RIMA) and extended it to cover the other components of the proposed Acre Sustainable Development Project in 2001.[125] For reasons that are not explained in the IDB appraisal report, however, the section of BR-364 that was eventually paved under the project was further reduced to 70.1 kilometers.[126] A specific study on "indigenous affairs" was also carried out for this project around the same time, again at the Bank's request.[127]

The EIA-RIMA for the proposed road improvement, which covered physical, biological, and socio-economic aspects, was technically well done, focusing on the potential direct and indirect impacts during both construction and subsequent "operation" of the paved road in its direct and indirect areas of influence.[128] Altogether, the latter involved a total area of 36,305 square kilometers, or 23.6 percent of the State of Acre. The EIA-RIMA also carried out a diagnosis of environmental quality with and without the proposed road improvement and considered both its positive and negative potential impacts. Among the potential adverse impacts identified in the indirect area of influence of the road segment to be improved, for example, were: (i) adverse air quality as a result of fires (to clear land for agricultural and ranching purposes); (ii) removal of vegetative cover and surface soil, leading to erosion and soil nutrient loss as the result of "dynamization" of the regional economy; (iii) deforestation due to the need for wood for civil works, improved access of the local population to forest areas, and, again, "dynamization" of the regional economy, leading to destruction of forest reserves and even the removal of rare species; (iv) loss of biodiversity due to increased land invasions and new rural properties; and (v) increased pressure on renewable natural resources as the result of increased agricultural and ranching activities induced by the improvement of access resulting from the newly paved road.[129]

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[125] Marcelo Piedrafta Iglesias, *Impactos Socio-Ambientais do Programa de Desenvolvimento Sustentável do Estado de Acre (BID-BR-0313)*, Rio de Janeiro/Rio Branco, April-May 2001. In addition to the pavement of 101.5 kilometers of BR-364, the road infrastructure improvements to be undertaken that were also considered in this report included paving of 20.1 kilometers of the access road to the Chico Mendes Agro-extractivist settlement and the improvement, conservation and maintenance of 744 kilometers of branch roads.

[126] In both cases, it is likely that alternative funding sources were found for the additional 147.6 kilometers that were covered in the 1996 EIA-RIMA.

[127] Carlos Ultramari, *Programa de Desenvolvimento Sustentável do Estado do Acre – Assuntos Indigenas*, Rio Branco, July 2001.

[128] The latter included the municipalities of Tarauacá, Cruzeiro do Sul, Rodrigues Alves, and Mancio Lima. The road segment to be upgraded cut through the first three of these municipalities, but the fourth was also included in its indirect area of influence because the section to be paved would also improve access to it.

[129] EIA, op. cit., Volume II.

Proposed mitigation measures for these impacts included: (i) monitoring and control ("*fiscalização*") of fires in the indirect area of influence of the road segment to be improved associated with implementation of the Economic-Ecological Zoning (EEZ)[130] for the region; (ii) elaboration of a master plan for occupation and regional development and a specific land use plan along the road corridor, both based on the EEZ, with the objective of reducing the predatory exploitation of flora and fauna in a way compatible with the exiting human settlements along the road; (iii) implantation of an efficient system of "*fiscalização*" to combat non-authorized cutting of timber and prevention of accidental and deliberate fires in the area of influence; (iv) allocation of financial resources equivalent to 5 percent of the value of the road improvement project to strengthen conservation units (and to better structure and improve management of existing ones in particular) along the section of the road to be upgraded; (v) creation of agro-forestry poles[131] along the highway to take advantage of the sustainable timber production potential; (vi) "*fiscalização*" of deforestation resulting from the "dynamization" of the regional economy and promotion of EEZ to order land occupation and use in the area; (vii) regularization or prohibition of predatory hunting and fishing; (viii) preventive actions by municipal governments by identifying, keeping a cadastre and monitoring immigrants in their territories to orient and manage the implantation of new productive activities; (ix) installation of "*agro-vilas*"[132] along BR-364 as a way of orienting new occupation along the road in accordance with the EEZ; and

[130] Economic-ecological or agro-ecological zoning in the Brazilian Amazon region had been introduced in the 1990s through a number of World Bank-supported programs and projects, including the G-7 Rainforest Pilot Program and the parallel Natural Resource Management Projects for Rondônia and Mato Grosso (see John Redwood III, "World Bank Approaches to the Brazilian Amazon, *op. cit*,) and the Pantanal (see John Redwood III, "The World Bank and the Pantanal, in Swarts (ed.), op. cit., but were no means a panacea in terms of controlling land use, especially when carried out primarily as technical exercises, and not also as participatory opportunities for public education and stakeholder negotiation. For one assessment of the experience in the Brazilian Amazon in this regard, see Dennis J. Mahar, "Agro-ecological Zoning in Rondônia, Brazil: What Are the Lessons?" in Hall (ed.), *Amazonia at the Crossroads*, op. cit.

[131] Agro-forestry activities were also a widely recommended approach to more sustainable development in the Amazon at the time. See Nigel J. Smith, "Agroforestry Development and Prospects in the Brazilian Amazon," in Hall (ed.), *Amazonia at the Crossroads*, op. cit.

[132] *Agro-vilas*, which also have a tradition in the Amazon region dating back to official "colonization" efforts along the Transamazon highway in the early 1970s and in Rondônia (along BR-364) and Mato Grosso (along the Cuiabá-Santarém highway) in the 1980s, are planned rural settlements established as residential and service centers for small farmer communities. For an empirical assessment of this approach to and experience with rural colonization in the region, see Anna Luiza Osório de Almeida and João Campari, *Sustainable Settlement in the Brazilian Amazon*, Oxford University Press, New York, 1995.

(x) regularization of land tenure situation in the area.[133] The RIMA, in turn, affirmed the following:

> 'Dynamization' of the economy is the principal positive impact [of the proposed road improvement] since…it will permit the increase of regional production and improve the level of income and the quality of life of the population, as well as being the principal economic justification for execution of the works foreseen….The indirect negative environmental effects of the 'operation' of the road in its area of influence of BR-364 will be produced primarily by the process of 'dynamization' of the regional economy, with one of the principal ways of minimizing these effects being elaboration of the Economic-Ecological Zoning of the State of Acre associated with a regional development program based on agro-forestry production having *agro-vilas*, extractive production areas and industrial transformation, with the first phase emphasizing the processing of wood and food products of extractive origins.[134]

The Bank-financed Acre Sustainable Development Project was designed in good measure to help implement these environmental and social mitigation measures together with the broader regional development program proposed in the EIA-RIMA, also taking into account the specific findings and recommendations of the two 2001 consultants' reports mentioned above. The first of these reports noted, for example, that "for the paving of BR-364, the "sanitation" [referring specifically to the clear definition of land tenure and titles] of the lands in the area of influence, establishment of public production forests, strengthening of surveillance units, application of environmental norms and sanctions, and application of the mitigation plan proposed in the EIA-RIMA will be required." It also identified as a significant environmental risk in the absence of these measures, "the potential deforestation, over a period of 25 years, of approximately 33 percent of the 100 kilometer corridor along the stretch of road to be paved, or roughly 4000 square kilometers." To avoid this, the report recommended undertaking a territorial organization plan for the corridor entailing 50 kilometers on either side of the road section to be improved and to strengthen the "*fiscalização*" of fires.

In short, the environmental assessment process required by the Brazilian federal government for the (longer) road segment to be paved – i.e., the 1996 EIA-RIMA – and,

[133]EIA, op. cit., Volume III.
[134] RIMA, op. cit. My emphasis.

subsequently, by the Bank for the broader Acre Sustainable Development Project as a whole constituted a comprehensive approach to the identification of potential environmental and social impacts and the proposal of measures – the most important of which were incorporated as major components of the project itself – to manage and mitigate them. By taking potential indirect – including induced development – as well as direct impacts in the project's broader (i.e., indirect, as well as direct) area of influence into account, this represents an example of good practice in advance of project approval and implementation.

4. The Santa Cruz-Puerto Suarez Corridor Program

The Strategic Environmental Assessment (SEA) carried out as part of the preparation of this major road investment project was financed through a US$ 750,000 Bank Technical Cooperation operation approved in December 1999. According to the Operation Plan for this TC, the feasibility study for the corridor, which included the Environmental Impact Assessment (EIA) required by the Bolivian Government and the final designs for this segment of the road had been contracted in 1997. However, the Bank's review of these reports identified "certain areas that needed improvement. In particular, the EIA was based on the environmental considerations applicable at the time the corresponding terms of reference were prepared and would not meet the current requirements for financing the Project." Thus, additional studies were needed "to conceive and detail a sound strategy for Government and Bank actions aimed at developing an adequate environmental management framework to address the potential impacts of the [road improvement] project and to examine the developmental possibilities in the area of influence of the Corridor."[135]

The SEA confirmed that the "concerns over the environmental and social impact of the highway were fully justified." More specifically, it found that "the area of influence includes an enormous forest mass, still relatively untouched, and with very valuable ecosystems, such as the Chiquitano Dry Forest, the Chaqueño Forest…and the Pantanal.[136] In addition, outside the large

[135] Inter-American Development Bank, *Bolivia: Plan of Operations – Strategic Environmental Assessment of the Santa Cruz-Puerto Suarez Transportation Corridor*, op. cit., pg. 1.

[136] The Pantanal, which lies mainly in neighboring Brazil, but also includes smaller areas in both Bolivia (about 10 percent of the total area of some 140,000-210,000 square kilometers) and Paraguay, is the world's largest wetlands. See, Frederick A. Swarts (ed.), op. cit., especially Chapter 4, Carlos B. Aguirre, *Wetlands in Bolivia: Pantanal Preservation and Sustainable Development*, pp. 43-53.

area of good land within the Area of Expansion,[137] agricultural use is limited in the rest of the territory with high environmental vulnerability." The resulting Bank Loan Proposal confirms that the SEA portrayed "a fragile environmental and social situation in the area of influence of the Santa Cruz-Puerto Suárez Corridor," observing further that, in environmental terms, "global experience in the past decades with the building or improvement of highways in isolated regions and with natural vegetation has had grave consequences: greater accessibility throughout the year and the reduction of transport costs causes a rapid expansion of the economic frontier (agriculture, extensive cattle-ranching and logging), which in turn results in massive deforestation, degradation of ecosystems and a loss of biodiversity." In social terms, moreover, the SEA described "the region's poverty and ethnic and social diversity: the majority of the population living in urbanized areas are poor, the indigenous peoples, small farmers and landholders that have come from other regions, the Mennonites, small landholders, day laborers, as well as large farms and cattle ranches." The lack of land tenure security and rural poverty, in turn, were seen as "the central factors contributing to vulnerability." In addition, the development that the highway will bring is going to cause conflict between modern production systems linked to global markets and traditional systems of subsistence agriculture. The rise in land value and the "permeability" of the…communities and small farmers who (sic) will join the population attracted by the project, will exacerbate existing social differentiation and private appropriation of communal lands. Up until now, the relative isolation of the region has somewhat ameliorated these factors, but this will change when the highway is improved. The difficult access helped to keep down pressure on the land and minimized the impact on ecosystems and the most vulnerable population. The new greater accessibility will increase land value and will extend the economic frontier, as well as exacerbate conflicts and the impact on society and the environment.[138]

Based on the SEA, the LP also described the direct impact of road construction and obtaining the corresponding rights of way, which would be 100 meters wide along the entire

[137] Although the Loan Proposal does not define what it means by "the Area of Expansion," it does provide a footnote right after mentioning it that states "the rapid conversion of forests into agricultural areas was caused by a zone approximately 100 km to the east of the Grande River where the Lowlands Project was financed by the World Bank," referring to an earlier agricultural development project in the region.

[138] IDB, *Bolivia: Environmental and Social Protection in the Santa Cruz-Puerto Suárez Corridor,* op. cit., pp. 7-8. My emphasis.

Pailón-Puerto Suárez section of the corridor, thus requiring the purchase or expropriation of an estimated 5,150 hectares. It was also expected to "affect 17 indigenous communities, 7 farming communities, 3 cooperatives 2 Mennonite colonies, 2 public institutions nearby and nearly 440 individual properties." The report goes on to affirm that, "since the highway crosses the area of greatest human occupation, the affected universe is significant within a regional context." Other "socio-economic consequences" of the road improvement project requiring mitigation, according to the LP on the basis of the SEA, were: (i) segmenting of territory and interference with productive activity; (ii) physical destruction of some communities; (iii) risk of accidents and social problems derived from living alongside operations and workers; (iv) loss of an advantageous position for some communities engaged in important commercial activity; (v) reorientation of growth for some communities; (vi) reorientation of labor on the part of some representatives selected by each of the indigenous communities; (vii) tension and conflict in communities resulting from economic pressure, migration and cultural changes; and, (viii) risk of accidents with the frequent [road] crossing of people and livestock.[139]

According to the LP, finally, the Environmental and Social Protection Project was designed to meet the needs identified in the SEA, particularly to "implement a series of environmental protection measures and measures to ensure regional sustainable development that will: (i) assure that works to improve the Santa Cruz-Puerto Suárez Corridor are carried out within the framework of a process of regional occupation that is planned and controlled and that does not pose risks to socioeconomic relations and natural ecosystems; (ii) assure that benefits of agricultural development and forestry that result from the road works will benefit all inhabitants of the area of influence as well as minimize any negative impacts on biodiversity and environmentally fragile zones, and that rights acquired by indigenous and small-farming communities are respected by carrying out a broad program to register and provide titles for land; and (iii) contribute to socioeconomic development in the zone of influence of the Santa Cruz-Puerto Suárez Corridor, optimizing the use of natural resources." It goes on to affirm that "all of the above requires that: (i) the prevention and compensation programs that are high priorities in the SEA (concession of property titles for land, protection of vulnerable zones, etc.) should be in place before the works begin; and (ii) the Bank's future loan to improve the

[139] Ibid., pg. 8.

highway include conditions that link disbursements to progress in the mitigation of the project's environmental impact."[140] However, as will be discussed in the section on project implementation and results below, in practice, this approach broke down as the two parallel projects proceeded.

It is nevertheless important to reiterate here that, even though it was based on the findings and recommendations of the Bank-financed SEA, the Santa Cruz-Puerto Suárez Environmental and Social Protection Project did not incorporate all of the management and mitigation measures identified by this assessment reportedly because of "budgetary constraints" on the part of the Bolivian Government. Thus, while the SEA seems to have been comprehensive and, thus, like the case of the environmental studies required by the Bank for the Acre Sustainable Development Project, can be cited as an example of good practice, its conclusions and recommendations were only partly reflected in the subsequent environmental and social protection project designed to help implement them. Thus, even if it had been properly implemented, the latter cannot similarly be considered to represent best practice in this regard. More generally, on the assumption that all the measures proposed by the management recommendations that emerged from the SEA were intended to mitigate or compensate for the likely negative environmental and social impacts of the planned road investments along the Santa Cruz-Puerto Suárez corridor, the financial costs associated with them can also be considered indirect costs of the road improvements themselves, and, thus, should have been taken into account in the *ex-ante* economic analysis of this combined road and environmental and social protection program, together with the costs of those actions that were specifically included in the two parallel Bank projects as designed. Other relevant conclusions from the respective case study report[141] are as follows:

i. While the SEA did a good job of identifying the potential positive and negative direct and indirect, including induced development – impacts of the proposed road improvement project, it gave insufficient attention to potential cumulative impacts of the road investment and other ongoing or proposed development projects in the

[140] Ibid., pp. 10-11. My emphasis.
[141] See John Redwood III, *Managing the Environmental and Social Impacts of a Major IDB-Financed Road Improvement Project in Bolivia,* op. cit.

road's area of influence. Thus, while the SEA appropriately focused on the larger area of influence of the Santa Cruz-Puerto Suárez road corridor within Bolivia, it does not appear to have adequately considered all the new agricultural development and other interventions projected or likely to take place in this region in the years ahead, and their potential collective environmental and social impacts, together with those of the road improvement *per se*.

ii. Nor, considering that the Santa Cruz-Puerto Suárez road was part of a much larger integration road corridor linking Brazil with Bolivia overland, did the SEA consider the possible indirect economic, social and environmental impacts of the increased international traffic (made possible by the new road investments in Bolivia) on the neighboring Brazilian portion of the Pantanal, the world's largest and one of its most sensitive wetlands, and elsewhere; in short, the possible trans-boundary impacts of the road improvement project and any needed additional environmental and social management and mitigation measures were overlooked.

iii. Even within Bolivia, moreover, the Bank's Loan Proposal for BO-0033 explicitly recognized that, due to country financial constraints, it would not be able to support all of the mitigation measures recommended by the Strategic Environmental Assessment (SEA) for the Santa Cruz-Puerto Suárez road improvement project; thus, not all of the measures considered necessary by the SEA were included in the project and no information was provided as to how – or even whether – these additional actions would be funded and implemented.

iv. The fact that there were considerable differences in the scope and cost of the environmental and social management and mitigation measures associated with the different versions of the SEA is of particular importance for at least two main reasons: (i) it is essential that both the territorial and substantive scope of the management and mitigation measures required to address the likely adverse impacts of the road project be adequately identified and assessed and that their associated financial costs be properly quantified and provided for; and (ii) as these

are, de facto, part of the indirect costs of the road improvement project itself, the monetary costs associated with managing, monitoring, remediating and/or compensating for the project's likely direct and indirect, including induced development-related, environmental and social impacts in its area of influence should be explicitly considered in the economic analysis of the associated road investments in addition to the direct construction costs involved, in order to determine the project's true economic feasibility. In the present case, had the environmental and social protection and management costs originally estimated by the SEA (i.e., reportedly on the order of US$ 600 million), or, even those later originally included in the considerably pared down version of this management plan (US$ 85 million), been included in the economic analysis of the road improvement project as a whole, its estimated rate of return would have been significantly lower, and perhaps, the actual viability of the project as a whole would have been in considerable question.

v. In any event, the relevant general lesson is the need to include all social and environmental costs associated with avoiding, reducing, mitigating, monitoring and otherwise managing and compensating for the direct and indirect impacts of a major road improvement project, together with their expected benefits, as an integral part of the economic analysis of the road investments *per se*.

vi. The pertinent Bank documents and the SEA also recognized that many of the potential adverse indirect environmental and social impacts of the road improvement project would only be felt over the long run, thus suggesting the need for additional and/or continued environmental and social protection measures beyond the implementation period of BO-0033; however, there is no indication as to how – or even whether – these measures would be funded and implemented.

5. The Interoceanica and IIRSA Norte Projects

As the Bank did not finance the Amazonian portion of the Interoceanica Highway in Peru, the application of IDB environmental and social safeguard polices was not required, nor did the Bank provide financial or technical support in this regard. As IDB safeguard requirements did apply to the IIRSA Norte project, on the other hand, because the Peruvian Government requested and the Bank later granted, a US$ 60 million Guarantee for this project, an SEA was carried out, although, unlike the situation with respect to the Santa Cruz-Puerto Suárez and Pasto-Mocoa (see below) road projects, it does not appear to have been financed by the Bank.

One particularly interesting feature of this assessment is how it defined the project's direct and indirect areas of influence of the IIRSA Norte road. First, it identified the "regions located in the Northern Amazonas Road Corridor, including their provinces and districts," considering the trunk road itself as an "integration corridor." Population density maps were also elaborated. Then, over this political division, the SEA traced the "road network consisting both of the project's trunk road and its feeder roads that link districts, towns and villages." The traffic flows among each of these agglomerations and the main road were also measured to determine distinct "transit zones." In combination, these "transit zones" along the entire length of the "integration corridor" were considered to form the project's direct area of influence and the "more distant zones where trips to the integration corridor originate or terminate" were considered to be its indirect area of influence. Local watersheds potentially affected by the project were also considered to be part of its area of influence. Elsewhere, the SEA observes that the direct area of influence of the project includes a "10 to 40 kilometer zone along the trunk highway, approximately." Field work for the SEA entailed specific visits to the previously defined direct and indirect areas of influence of the road in the three major ecological regions cut by the road corridor: the coast, the Andean highlands, and the Amazon.[142] Altogether, the SEA estimated the direct area of influence of IIRSA Norte to involve some 1,961,273 hectares and the indirect area another 7,435,647 hectares, or, jointly, a total of 93,969 square kilometers.[143]

[142]See José Enrique Millones O., Coordinator, et. al., *Evaluación Ambiental Estrategica (EAE) de la Operación del Corredor Vial Amazonas Norte en el Perú – Informe Final, pp. 13-14.*
[143] Ibid., pg. 56.

This procedure in order to empirically determine the project's actual direct and indirect areas of influence (which can, of course, also change over time) is superior – at least in an area which has already witnessed considerable settlement and productive occupation -- to that apparently followed in the case of the Amazon portion of the Interoceanica highway and elsewhere in which an ultimately arbitrary distance of 50 kilometers on either side of the main road was taken to define its indirect area of influence. It is also noteworthy that, at least for purposes of the SEA, the direct area of influence of the road not only includes the right of way of the trunk highway itself, but those of the secondary and/or feeder roads that lead out from it as well. On the other hand, the *de facto* implied definition of the project's direct area of influence in the Bank's Guarantee documents -- i.e., the area over which the concessionaire has legal responsibility for meeting certain (undefined) social and environmental commitments at least during the construction phase[144] -- is not as broad, as it does not also include the aforementioned feeder roads. So, there appears to be a significant difference with the SEA's definition in this regard.

For each of the three major eco-regions (i.e., coast, highlands, and Amazon) that the project's area of influence involves, the SEA then proceeded to systematically analyze the following biophysical aspects: climate and meteorology, including the effect of El Niño in the area; hydrology, including critical watersheds; natural resource conservation problems; geology and geomorphology; soils; land use capacity; actual land use; ecology and natural habitats (or what it refers to as "life zones"); flora; and fauna.[145] This is followed by an assessment of "environmental sensitivity and risks," which concluded that just over one-third of the area of influence is of "very high" sensitivity and another 14 percent of "high" sensitivity, jointly constituting nearly half of the total area considered.[146] The SEA also presented the results of a socio-economic diagnosis of the entire area of influence covering the six regions, 18 provinces, and multiple districts that together composed the project's area of influence. This analysis covered the following topics: geographic location and occupation/settlement patterns; demographic aspects, including population dynamics, population centers, migration, population projections, and indigenous communities (by location, ethnic group, specific cultural

[144] There is no definition of either the project's direct or indirect area of influence in either the Bank's Guarantee Proposal or its Guarantee Contract with the Peruvian Government, however.
[145] SEA, op. cit., pp. 56-99.
[146] Ibid., pg. 100.

characteristics, and socio-economic and cultural implications of the road axis);[147] social aspects, including health, education, and social infrastructure; economic aspects, including human resources, gross internal product and economic sectors, economic activities (i.e., agriculture, ranching, mining, fisheries, forestry, industry, export activities, and tourism); transport infrastructure and services (including land, port, and air); and the poverty situation.[148] Finally, it synthesized the principal results of these two major assessments[149] and examined in considerable detail existing international agreements, including with respect to IIRSA, Peruvian Government policies, and national, sectoral, interregional, and regional plans and programs of relevance to "operation" of the Amazonas Norte road corridor.[150]

The SEA next proceeded with an analysis of scenarios for the short (2004-08), medium (2009-13), and long (2014-23) terms and, in doing so, considered the situation both without the project and two "with project" situations, which are labeled the "business as usual" and "optimistic" scenarios, respectively. It then identified specific interventions, analyzed them and their associated environmental impacts, recommended "preventive" or "potentializing" measures to be adopted and identifies the agencies responsible for implementing, enforcing or complying with them for each scenario and time period, and summarized the results.[151] In a separate chapter, it assessed the project's primary and secondary negative and beneficial socio-environmental impacts. "Primary" negative impacts, for example, are defined as those due "directly to the operation of the road corridor and *vice versa* that can put its operationality at risk." Secondary adverse environmental impacts, in turn, are those "that will result indirectly from the operation of the road corridor and vice versa, which do not result in the interruption of its operationality."[152] Again, for each such impact identified, the SEA provides suggestions for measures to address it, identifies relevant plans, policies and programs, as well as the institutions that should be involved. "Beneficial" impacts, in turn, are identified in terms of the specific "induced situation," including, for example, "dynamization of the economy."[153]

[147] Ibid., pp. 113-130.
[148] Ibid., pp. 103-201.
[149] Ibid., pp. 202-209.
[150] Ibid., Chapter 6, pp. 210-248.
[151] Ibid., Chapter 7, pp. 249-301.
[152] Ibid., pg. 303.
[153] Ibid., pp. 302-324.

The potential adverse socio-environmental impacts associated with operation of the IIRSA Norte corridor identified by the SEA generically included the following:

- increase in illegal timber extraction, contraband and drug trafficking activities and change in the hydrological cycle;
- uncontrolled and/or chaotic growth of the population centers, affecting the urban-rural infrastructure and land tenure;
- generation of fragile and vulnerable zones subject to landslips and landslides;
- occurrence of the El Niño phenomenon, which could affect the road infrastructure, causing the interruption of vehicular traffic;
- increased "transculturation" of indigenous peoples, observing further (in contradiction to what is stated in the Bank's Guarantee Proposal) that this includes indigenous communities located in the project's direct area of influence;[154]
- alteration of air quality and, consequently, increase in the health problems originating in environmental contamination;
- loss of tourism attractions, affecting landscape quality, and loss of biodiversity;
- contamination of rivers and/or water courses and soils as the result of inadequate management of solid and liquid wastes caused by the deficit in sanitation services and their functioning; and,
- interruption of the operation of the road corridor caused by interventions by the affected population and/or native communities.[155]

This is a much broader set of potential indirect negative environmental and social impacts than are explicitly mentioned in the Bank's Guarantee Proposal for the IIRSA Norte Project or referred to in the respective Guarantee Contract. The SEA also identifies a set of likely positive impacts, some of which, however, could also have indirect negative environmental and/or social consequences, such as an increase in land values and improvement of the secondary road system.

[154] More specifically, the SEA affirms (pg. 321): "The indigenous communities that are located in the direct area of influence of the Amazonas North road corridor, such as the Aguarunas and Kechwa Lamistas (both in San Martin), could suffer an intensification of the 'transculturation' process, due to the increment of the commercial dynamization that will bring greater contact between these indigenous groups and the merchants, which could degenerate into opposition on the part of these communities to the operation of the *Amazonas Norte* Road Corridor (CVAN), affecting the sustainability of the road corridor."
[155] Ibid., pp. 319-322.

It concludes with a set of policies for a socio-environmental management plan (S-EMP) -- including for indigenous communities -- in the project's area of influence, followed by a proposal for this plan itself. Among the environmental policies it identifies, for example, are: (i) ecological organization in the Paita coastal zone; (ii) recuperation and preservation of natural areas in the direct area of influence of the project; (iii) sustainable development of the Amazonian region in the direct area of influence of the road; and (iv) management of the natural resources in the Amazonian territory in the direct area of influence of the road corridor. It also proposes territorial, transport, normative-institutional and socio-cultural policies.[156] In short, the SEA recommends a broad set of land use, environmental management, and socio-cultural policies as the basis for its proposed environmental and social management plan for the IIRSA Norte corridor, the vast majority of which appear to have been overlooked – or, at best, are never specifically mentioned – in the Bank's Guarantee Proposal and Guarantee Contract with the Peruvian Government.

In summary, the comprehensive S-EMP proposed by the SEA, as was also the case with the Santa Cruz-Puerto Suarez Corridor Program, seems to go well beyond the scope of the environmental and social "commitments" referred to in the Bank's Guarantee Proposal and Guarantee Contract for the IIRSA Norte Project. As noted in the previous section, while the SEA is, indeed, mentioned in these Bank documents, the only "special condition" – or condition of any sort – specifically associated with it is that "it must be demonstrated that the MTC [Ministry of Transportation and Communication] has made progress in implementing the programs accorded priority in the strategic environmental assessment, including the drafting of an agreement with INRENA." The Bank's documents neither define which of the programs in the SEA (that, in any event, are never specifically identified) were "accorded priority," nor what "progress in implementing" them means in practice. In addition, they do not indicate who or what entity was supposed to make this determination or make any reference to environmental and/or social programs in which MTC is not directly involved. And nowhere in the Bank documents are its own monitoring and supervision responsibilities in this regard – or in relation to the project more generally – explicitly spelled out.

[156] Ibid., pp. 325-330. The normative-institutional policies, for instance, cover: (i) legal strengthening in the area of influence; (ii) control of territorial occupation in urban areas; (iii) control of territorial occupation in rural areas; (iv) efficacy of the environmental "normativity" and "institutionality;"(v) environmental institutional management at the national, regional and local levels; and (vi) environmental management instruments.

Among the conclusions and lessons that can be drawn in relation to the Bank's experience regarding environmental and social assessment for the Interoceanica and IIRSA Norte road improvements in Peru,[157] are the following:

i. It is important to clearly define the respective direct and indirect areas of influence of the road (and/or other major infrastructure) project to be assessed. The Interoceanica and IIRSA Norte projects illustrate different possible approaches to this: (i) arbitrarily defining a fixed corridor of a certain width along either side of the road (e.g., 50 kilometers in the Interoceanica case); or (ii) empirically determining an area of influence on the basis of the existing road network (including feeder roads) and settlements in the region through which the trunk road passes, as was done for purposes of the SEA for IIRSA Norte. The latter approach makes particular sense in areas where the trunk road is already in place – or largely in place – and is being paved and/or otherwise upgraded, as long as the area of influence so defined is sufficiently flexible that it can be extended as new feeder roads – and/or extensions of existing such roads – and settlements are established (generally at a greater distance from the trunk road) over time. The former, however, may be more sensible, at least initially, in frontier areas where the new or improved trunk roads are likely to induce considerable new productive occupation as a result. In either case, it is essential to define these direct and indirect areas of influence – and to clearly distinguish between them for purposes of needed and/or required environmental and social management plans -- from the outset and to ensure that this is evident in Bank project documents, including legal agreements.

ii. In the two cases reviewed immediately above, there seem to have been two different definitions of the road's direct area of influence. Bank project documents, presumably including associated contractor and/or concessionaire contracts, generally seem to suggest that the direct area of influence of a major

[157] See John Redwood III, *Managing the Environmental and Social Impacts of Major IDB-Supported Road Improvement-Related Projects in Peru*, op. cit.

road such as the Interoceanica or IIRSA Norte refers to its immediate right of way and those adjacent areas used as borrow pits, dumping sites, and construction worker camps, etc. The SEA for IIRSA Norte, however, defines the road's direct area of influence by also taking into account existing feeder roads and settlements in addition to the immediate right of way of the trunk road, then identifying more peripheral areas, including watersheds, likely to be affected by the improved road over time as its indirect area of influence. However, while this is never made clear in the Guarantee Proposal and Contract for IIRSA Norte even though both of these documents explicitly refer to the SEA, it appears that the Bank assumed that the direct area of influence of this road was that directly affected by construction works only – i.e., those areas over which the concessionaire would have control -- and not the broader area considered by the SEA.

iii. It is not clear what role the Bank played in the decision to undertake an SEA, as well as a more traditional EIA, for IIRSA Norte, but it was the correct one. It is also not clear whether a similar exercise was carried out for the Amazonian portion of the Interoceanica, although this seems less likely, and if a strategic assessment was not undertaken, it should have been. However, another consideration is that, since an SEA was, in fact, performed for IIRSA Norte, the financing agencies, including the IDB as Guarantor, should have clearly spelled out its main findings and recommendations -- ideally summarizing them in the main text and providing greater detail in a specific annex in the respective project document – as well as support the consistent and effective implementation of the latter during both the construction and operation phases of the project, including through specific contractual conditions, neither of which appears to have been the case with the Bank's handling of IIRSA Norte.

iv. The Bank, of course, is entitled to disagree with specific SEA – and/or EIA -- findings and recommendations based on the results its own independent environmental and social analysis or review. However, if it does so, this should be made explicit in project documents, as should the reasons for such disagreement.

The Bank should not simply overlook, misstate or distort these findings and recommendations, especially when it holds out the SEA (and/or EIA) as part – indeed, the analytical basis -- of its own environmental and social due diligence process, as appears to have been the case with the IIRSA Norte Guarantee.

v. Another fundamental lesson, which is also embodied in the aforementioned SEA and is fully consistent with the findings of the other projects considered in this review, is that Bank-supported projects that involve major improvements (i.e., construction and/or paving) of extensive trunk roads, such as the Interoceanica and IIRSA Norte highways, whether they are part of an international highway link or not, are likely to result in significant induced development impacts, both positive and negative. As observed at the outset of this report, this is especially likely to be the case in natural resource rich tropical "frontier" regions, which, at least in the South and Central American context, are also likely to house vulnerable indigenous and other "traditional"(e.g., extractivist and/or subsistence farmer) low-income populations. Thus, even if the primary stated objective of such projects is to strengthen interregional or international (physical and economic) integration and competitiveness, they are also likely to have substantial local development impacts, both positive and negative. In short, both by significantly reducing transport costs to and from and greatly increasing access to (renewable and non-renewable) natural resources in such areas, independently of whether this is a declared project objective or not, it is likely to spur new rural and urban[158] settlement, land occupation, forest conversion, and other forms of social and environmental change, which need to be carefully assessed and managed.

vi. Doing so, as the SEA for IIRSA Norte clearly indicates, will require a broad range of social, environmental, and other measures (e.g., territorial and land use

[158] Indeed, often, ultimately, new settlement in frontier regions over time tends to become largely concentrated in urban areas, which also face considerable demands for new infrastructure, services, and housing facilities as a result of increased population pressures. For a discussion of this tendency in the Brazilian Amazon context, see John Browder and Brian Godfrey, *Rainforest Cities: Urbanization, Development, and Globalization of the Brazilian Amazon*, Columbia University Press, New York, 1997.

planning, institutional capacity building, etc.) in the project's direct and indirect areas of influence over the short, medium, and longer term in the form of a multi-sectoral and multi-institutional regional sustainable development program. This is entirely consistent with the approach, in fact, taken by the Bank in its two earlier major road-related projects in the Amazonian state of Acre in Brazil, as well as attempted in the earlier Bank projects for the sustainable development of Darién and the Santa Cruz-Puerto Suárez corridor. However, it is not clear that these lessons were adequately reflected in the Bank's Guarantee operation for IIRSA Norte.

vii. Finally, the Bank's experience in Peru also reiterates the need to take cumulative environmental and social impacts into account in projects involving many small road segments, as in the Decentralized Rural Transport Program, jointly financed by the IDB and the World Bank. This project, depending on the actual location of the rural roads whose improvement is financed, may also impact the areas of influence of the Interoceanica and IIRSA Norte highways. Independently of this, however, to the extent that numerous such roads are being upgraded in the same specific subregions, they could well have significant cumulative indirect effects that need also need to be carefully identified, assessed and addressed even if, as the project report affirms, the impacts of each individual segment is, indeed, quite localized and minimal. At present, this project does not seem to consider such potential impacts or include measures to monitor and manage them. More broadly, the need to take cumulative impacts into account also applies when other major infrastructure and/or productive investments are taking place in or planned for the project's direct and indirect areas of influence.

6. The Pasto-Mocoa Alternate Road Project

As was the case of the Santa Cruz-Puerto Suárez Corridor, the Bank provided financing for the preparation of both an improved EIA and an SEA for the Pasto-Mocoa road improvement project through a Technical Cooperation operation. Even though the Terms of Reference that

were included in the Operations Plan for this TC[159] refer to an SEA, the actual product delivered by the consultants was called a Regional Environmental Assessment (REA), a change that will be further discussed below. Approved in November 2006, the TC had three components: (i) phase III detailed engineering and environmental and social impact studies;[160] (ii) environmental, social, and economic studies; and (iii) institutional strengthening. The first component entailed updating and complementing the engineering and EIA studies for the San Francisco-Mocoa variant to meet MAVDT's requirements, whose costs would be covered entirely with Government counterpart resources and which, as previously observed, resulted in substantial improvements in the final design of the new road from an environmental perspective. The second, exclusively financed by the Bank grant, had the following subcomponents: (i) Strategic Environmental Assessment (SEA) of the Pasto-Mocoa corridor; (ii) Environmental and Social Management Plan (ESMP) of the Forest Reserve of the upper Mocoa River Basin, including associated socio-cultural studies; (iii) economic feasibility and baseline studies; and (iv) a resettlement program. The third component, also financed by the Bank grant, was to be carried out by Conservation International (CI), which would be specifically contracted for this purpose.

The declared objectives of the SEA, according to the associated Operations Plan, would be "to analyze the possible cumulative and synergistic impacts and the environmental management and socio-cultural opportunities induced by the improvement of the Pasto-Mocoa road and to involve the principal actors in the discussion of sustainable development alternatives." For this, the SEA was expected to "consider the road corridor in its strategic functions in terms of bi-oceanic connection and as a new connection axis of the region with Bogotá."[161] The ESMP for restoration and preservation of the Forest Reserve, in turn, would be developed with "an ecosystemic focus" and was charged with "proposing measures and technical specifications for the design, construction and operation of the [San Francisco-Mocoa road] variant with an eye toward guaranteeing the protection of natural resources and the forest

[159] Inter-American Development Bank, *Colombia – Preparación del Proyecto de Infraestructura Regional Corredor Vial Pasto-Mocoa (CO-T-1038) – Plan de Operaciones*, Washington D.C., November 2, 2006.
[160] Further information on this EIA is presented in an annex to the PO entitled *Terminos de Referencia – Actualización y Complementación del Estudio de Impacto Ambiental de la Construcción y Operación de la Variante San Francisco-Mocoa, en el Departamento de Putumayo*, October 23, 2006.
[161] Ibid, pg. 7. Additional detail is provided in the Terms of Reference annexed to the PO – see IDB, *Terminos de Referencia – Elaboración de Una Evaluación Ambiental Estrategica de la Via Pasto-Mocoa, Republica de Colombia*, October 23, 2006.

reserve."[162] The economic feasibility and baseline studies were expected to "comprehend the benefit/cost analysis of the construction and operation of the variant, including detailed traffic studies and the collection of the necessary data to establish a baseline with respect to the anticipated benefits." The feasibility study was also expected to "incorporate exogenous benefits such as: socio-economic development as the result of regional integration; expansion of legal crops and, as a consequence, reduction of illicit ones; reduction in civil violence and, its counterpart, increased security and reduction in population dislocation."[163]

Among other outputs, this Technical Cooperation resulted in the PMASIS component of the alternate road project, based on the project's Environmental and Social Management Report (ESMR), which reflected some of the results of the REA. Although not summarized – and barely mentioned -- in the Loan Proposal, the ESMR is nevertheless an important part of the project. It states, for example, that, altogether, US$ 16 million, or 7.9% of the total project cost for the road improvement, would be dedicated to environmental and social management activities, including, in addition to US$ 11.4 million for PMASIS, US$ 2.1 million for land acquisition along the right-of way, and US$ 2.5 million for the environmental management plan for road construction works.[164] The ESMR also affirmed that the area likely to be most strongly affected by the project is the Forest Reserve (whose management needed to be considerably strengthened) and its area of influence, although this area is not clearly identified. In the process, the report identified the following types of potential environmental impacts: deforestation, (forest and habitat) fragmentation, increased access (to natural resources), inadequate occupation and use of land, possible resource (especially mining) concessions, erosion, water pollution, adverse effects on flora and fauna, and inadequate governance. Local economic, resettlement, and direct construction impacts, as well as possible effects on indigenous communities, are also cited.[165]

The ESMR gives little attention, however, to possible project impacts on indigenous communities or governance concerns beyond the direct area of influence of the new road and the expanded Forest Reserve, nor does it propose measures to address them. A similar shortcoming

[162] Ibid., pg. 7. Further detail is provided in the annexed ToRs entitled *Terminos de Referencia – Elaboración del Plan de Manejo Ambiental y Social para la Reserva Florestal Protectora de la Cuenca Alta del Rio Mocoa, en el Departamento de Putumayo*, October 23, 2006..
[163] Ibid., pg. 7.
[164] Inter-American Development Bank, *Colombia – Corredor Vial Pasto- Mocoa Variante San Francisco Mocoa: Informe de Gestión Ambiental y Social (IGAS),* Washington D.C., October 20, 2009 (hereafter ESMR).
[165] Ibid., pp. 11-16 provides further details about each of these types of potential impact.

applies to many of the various types of possible environmental impacts mentioned above. While this narrowing of the scope of proposed actions to the direct area of influence of the new road and adjoining Forest Reserve may represent a pragmatic response because it would be more difficult and costly for the project to include remedial and regional development interventions that go beyond this area, this does not mean that such broader indirect impacts may not ultimately be relevant or significant over time. The relative inattention to the possible broader indirect effects of the new road would, thus, appear to be a shortcoming of the ESMR.

No specific reason is given in the Bank's project documents as to why the proposed "Strategic" Environmental Assessment became a "Regional" one in practice, although, as the process evolved, the REA was considered as the appropriate type of SEA for this particular case.[166] The region studied was composed of 14 contiguous municipalities in three neighboring departments, covering an area of 14,586 square kilometers. While arguably focusing on the zone of highest impact of the new alternate road to be built under the project, even leaving aside the possible non-Colombian parts of the eventual area of influence of the proposed Tumaco-Pasto-Mocoa-Puerto Asís-Belém do Pará corridor,[167] the study area excluded a substantial share of its potential Colombian portion, including both the extensive Amazonian region to the east of Mocoa and Puerto Asís and most of the corridor between Mocoa and Bogotá to the north, as well as much of the corridor westward from the municipality of Nariño (just northeast of Pasto) to Tumaco. Exactly how the study area was determined and why other parts of the road's larger potential area of influence were not considered are not clear, however. Bank staff familiar with the project later explained that this was most likely due to the limited additional traffic expected to be generated by the road between Mocoa and Tumaco, given that the port facilities at the latter city are precarious and there are no plans at present to expand or upgrade them, while most of the

[166] The literature on SEAs, in fact, refers to several types of assessments, including both sectoral and regional, as well as policy or program-based ones. With respect to the latter, see, for example, Kulsum Ahmed and Ernesto Sanchez-Triana (editors), *Strategic Environmental Assessments for Policies: An Instrument of Good Governance*, World Bank, Washington D.C., 2008. SEAs also frequently include social assessments, and, thus, are sometimes labeled SESAs, and there is even one recent case where a Strategic Environmental Assessment has also been combined with a Poverty and Social Assessment (SEPSA), see World Bank, *Pakistan Strategic Environmental, Poverty and Social Assessment of Trade and Transport Sector Reforms*, draft, Washington D.C., October 2011.

[167] While it is true that, because of the additional investments at and beyond Puerto Asís needed to make the rivers at the Colombian Amazonian end of the proposed intermodal transport corridor from Tumaco to Belém navigable, and, thus, the road investment is not likely to have any impact in terms of increased trade with Brazil over the foreseeable future, the project area is located just across the Putumayo River from northern Ecuador and, despite terrestrial barriers (i.e. mountains and the river itself), over time, the improved road have some indirect transboundary economic, environmental and/or social impacts, although this possibility was not considered by the REA.

additional road-based commerce in the years ahead is likely to be between the project region and Bogotá to the north. However, this situation would seem to undermine one of the larger alleged rationales for the project in terms of its eventual facilitation of greater international trade and integration.

These considerations notwithstanding, the objective of the REA, according to the ESMR, was "to analyze early on the possible environmental and socio-cultural risks and opportunities induced at the national, departmental, and municipal levels by the improvement of the Pasto-Mocoa road in order to permit their discussion by key institutional actors prior to its implementation." The ESMR added that "the need for the REA derives from the consideration that construction of the alternate road should not only include the works and actions needed to improve the overland communication between Pasto and Mocoa, but should also respond to the direct, indirect, synergistic, and cumulative impacts that these improvements could induce on the environment and the population along the road corridor."[168]

The Action Plan to result from the REA was expected to have four basic components: (i) territorial organization; (ii) sustainable regional biodiversity management; (iii) strengthening of indigenous communities in the Putumayo region; and (iv) measures to take advantage of economic opportunities. As suggested above, however, several questions can be raised concerning the adequacy of both the spatial and the substantive scope of the REA and its associated action plan. Based on the ESMR alone, for instance, it is not evident what actions were proposed in the REA to address possible indirect environmental and social impacts associated with the improved road connection outside the area of the proposed expanded Forest Reserve.[169] The extent to which possible cumulative impacts resulting from other regional and local development initiatives acting together with the road improvement in the area of influence of the Pasto-Mocoa highway (and its eastward extension to Puerto Asís) were identified and assessed as part of this exercise is likewise unclear. The REA indicates that the geographic scope of the study was the "physical space or area where, in a direct manner, it is assumed that the

[168] IDB, *Colombia - IGAS*, op. cit., pg. 94.

[169] This would include the area within the proposed Integrated Management District (DMI) -- which is described in the REA as a "buffer zone for the economic activities of Mocoa"-- both between the Reserve and Mocoa, including along the alternate road itself, and, perhaps more importantly, between Mocoa and Puerto Asís, as well as areas within the Colombian Amazon region beyond the proposed DMI – to which access will also be enhanced as a result of the improved road.

effects of the improvement of the connection between Pasto and Mocoa will be generated." This space was determined "through a discussion…between the consultants and the staff of INVIAS and IDB, with one of the criteria for identification of the study area being municipal boundaries, such that its geographic limits correspond to the geographic limits of the affected municipalities."[170] Thus, the study area refers only to those municipalities located in the direct area of influence of the road to be improved. Possible indirect effects on areas farther afield, therefore, do not appear to have been considered.

The REA nonetheless recognized that this direct area of influence is – and will continue to be -- affected by other activities in addition to the road.[171] It observed, for example, that parts of the study region have been subject to substantial in-migration over the past several decades and are the location of mineral and hydrocarbon extractive activities, together with an active agricultural frontier. Between 1985 and 2005, much of the area was "characterized by…fragmentation, illicit crops, expansion of the agricultural frontier, and the growth of urbanization," according to this source. These factors had resulted in "instability in the occupation of the soil by economic activities," with repercussions on biodiversity conservation, while, over the previous decade, illegal activities, including cocaine production, had generated both incentives and disincentives for new settlement.[172] Thus, at least part of the study region – and, consequently, of the direct area of influence of the San Francisco-Mocoa alternate road – appears to have been subject to considerable occupation and new economic activities, both legal and illicit, as well as to agricultural frontier expansion and rapid urbanization in recent decades. Elsewhere, the REA states that the regional economy is quite "diversified," and briefly describes its agricultural, ranching, forestry/timber extraction, mining, and hydrocarbon activities. It likewise observes that governance in the region is "low."[173] This dynamic, complex, and problematic situation does not come across clearly in the ESMR or other project reports, however. Nor do these latter documents indicate how construction of the alternate road may affect -- either positively or negatively -- these activities, the intensity and nature of the related

[170] See Unión Tau Temporal Consultora Ambiental, PROINTEC, Ambiental Consultores, *Evaluación Ambiental Regional de la Via Pasto-Mocoa, Informe Final Ajustado Reumen Ejecutivo EAR*, Bogotá, Colombia, June 16, 2008, pg. 6.
[171] Ibid., pp. 6-7.
[172] Ibid., pp. 10-11, 17-18, 20, 22.
[173] Ibid., pp. 22-23 and 25.

land occupation and use process, any associated potential future environmental and social impacts, or the measures required to adequately address any such impacts.

Based on its diagnosis, the REA nevertheless summarizes the “key themes” or concerns, both positive and negative, in the study region under the following headings:

Environment: existence of high levels of biodiversity and a high number of protected species; evidence of deterioration in surface water sources; unsustainable forest extraction processes; unsustainable extraction of fauna and non-timber flora; deficiencies in sanitation infrastructure in the human settlements; and, loss of ecosystem functionality and integrity.

Social: permanent and growing dynamic of migration flows and forced displacement; deficiencies in the provision of social services; important cultural diversity and wealth; presence of numerous indigenous communities in the demographic and social dynamics of the region; conflicts around the indigenous communities’ territories and risk of their worsening due to the weaknesses in property rights; erosion of the cultures and quality of life of the indigenous communities; low quality of life indices of the population; and change/deterioration of the cultural patterns.

Economic: consolidation and growth of the presence of illicit crops in the region; historical tendency and important potential to receive direct investment in productive macro-projects; limitations on the commercialization of local production and difficulties to access the formal financial system; weak local entrepreneurial capacity; potential to take advantage of endogenous and exotic products and tourism development; weak and poorly structured economy, principally extractive in nature; little technology transfer to local communities; predominance of low productivity agricultural and ranching activities which are limited by the soil conditions; and incipient and poorly structured development of new agro-ranching dynamics.

Institutional: weakness and lack of coordination of national, regional, and local institutions with responsibilities in the region; existence of social and economic development plans and instruments with low regional impact; incipient levels of inter-institutional coordination in some parts of the area; low levels of governability; insecurity due to the presence of illicit activities; and, environmental institutionality with limited capacity for monitoring and control.

Territorial: growth of spontaneous occupation of the territory resulting in a fragile territorial structure; existence of deficient and disarticulated territorial organization mechanisms

without a vision of the region; land use conflicts; deficiencies in the structure of property rights; growth of urbanization and the territorial development of population centers with deficient supply of urban services that structure their development; the incipient ordering of the territory on the basis of conservation criteria; a deficient internal communication system; and insufficient external communication infrastructure.[174]

In order to address these issues, the REA identifies what it refers to as "potential or latent dynamics" for: (i) strengthening the regional social structure; (ii) institutional legitimization; (iii) strengthening territorial integration; (iv) strengthening environmental authority; and (v) "endogenizing" the economic growth pattern.[175] It then assesses the likely effects of the road project, starting with what it calls the "driving forces" expected to be produced by it -- specifically improved interregional, national and international connectivity, the increment in transport flows, and intervention in the territory -- followed by what are characterized as the "primary effects" that are expected to occur as a result of these forces, which are divided into several categories: (i) territorial effects; (ii) economic effects – more specifically increases of: transport services, agricultural and ranching activities and production in the Sinundoy Valley, regional, national, and international tourism, forest production for interregional, national and international markets, and commercialization of "exotic" products and biodiversity in the national and international market, together with estimation of the economic repercussions of the Pasto-Mocoa road and effects on the "disorderly" occupation of the region due to the expected increment in economic activity; and (iii) social effects – expectations and social conflicts and intensification of the process of alteration and loss of cultural (i.e., indigenous peoples') "cosmovisions." The REA also sought to identify the induced and synergistic or systemic indirect effects of the road and its cumulative effects on biodiversity, with the latter being the result of both the "primary" and the induced effects of the road together with other initiatives and infrastructure in the region.[176] The REA does not explain, however, why its analysis of cumulative impacts is restricted to biodiversity, thus leaving aside other potentially serious cumulative environmental effects, such as with respect to deforestation, land degradation, and water quality.

[174] Ibid., pp.27-29.
[175] Ibid., pg. 36.
[176] Ibid., pp. 36-38.

In the case of each of the potential effects it identifies, the REA starts with certain assumptions. In the analysis of social effects, for example, the premise is that "the increment in the transport flow motivated by the connection between Pasto-Mocoa could become an incentive for the activation of social conflicts in the region, with the induced effect of deterioration in regional governability." It likewise observed that "construction and operation of the San Francisco-Mocoa road could motivate conflicts with the indigenous communities in the region, as this could be used as a pressure mechanism to require or claim rights and unsatisfied promises" having similarly adverse effects on regional governability as the aforementioned social conflicts.[177] As concerns cumulative effects on biodiversity, in turn, it concludes that these would be "high for the zone studied and taking into account the potential pressures and the high affected biodiversity values…In other words, the effect on biodiversity will be predictably greater than would be expected in areas of lesser value submitted to similar pressures." [178] In short, unless firm action is taken to protect it, biodiversity in its direct area of influence would be at particular risk as a result of construction of the new road.

Despite the above statements, on balance, the REA reaches a generally upbeat conclusion -- although it is not clear on what this optimism is based -- to the effect that "improvement of the Pasto-Mocoa road can, as a function of its diverse territorial, economic, social and environmental effects, modify the state and behavior of the regional sustainability system, making it more sustainable in the long run." Among other things, however, this assumes that the proposed mitigation measures will, in fact, be fully and properly implemented and adequately sustained over time. The REA also observes that the road is expected to have essentially positive effects in both economic and spatial terms, including with respect to territorial integration at the regional level, while the principal potential adverse effects would be, as suggested above, in terms of the road's possible impacts on indigenous people and biodiversity.[179] Hence, the proposed Action Plan focuses on the measures considered necessary to address these issues. As indicated above, however, this analysis seems to overlook other relevant considerations, including potential

[177] Ibid., pp. 49-51. My emphasis. This, in fact, seems to have occurred in connection with the recent requests made both to the Colombian judiciary and the Bank's Independent Consultation and Investigation Mechanism (ICIM) by two local indigenous groups, which seems to have long-standing land claims by these groups to part of the area proposed to compose the expanded Forest Reserve as their main underlying motivating factor.
[178] Ibid., pp. 56-57.
[179] Ibid., pp. 57-59.

indirect and cumulative environmental impacts other than on biodiversity and, more broadly, possible indirect -- including induced development -- and cumulative impacts outside the immediate study area. Potential adverse social impacts on local populations other than indigenous communities, such as on poor *campesinos,* who may be negatively affected by other groups attracted to the region as a result of the road, also seem to be generally overlooked in this assessment and the associated Action Plan.

Specific conclusions and lessons that can be extracted from this experience, [180] therefore, include the following:

i. The project's direct and indirect area of influence – for purposes of potential direct, indirect and cumulative environmental and social impact identification and remediation – should be explicitly defined and indicated in Bank Loan documents, together with a clear explanation as to how this area was determined. In the present case, the ESMR annex does identify the "study region" for purposes of the REA, but, for the most part, this seems to be the area likely to be directly impacted by the road improvement project and not the larger area that may also be indirectly affected. Thus, the region considered does not include areas farther to the west, north, and east of the road section to be built, paved, and/or otherwise upgraded under the project, especially along the route north to Bogotá, which may be affected by increased settlement, land use changes, and new or expanded productive activities with the associated environmental and social impacts, induced in part by the project.[181] Even though Bank staff familiar with this operation argue that the additional traffic likely to be generated by the improved road is not likely to be significantly greater than that which presently exists -- thereby implicitly calling into question the economic rationale for this undertaking and its feasibility from a cost-benefit standpoint -- these more distant zones would nevertheless seem to constitute parts of the indirect area of

[180] For additional details, see John Redwood III, *Managing the Environmental and Social Impacts of A Major Bank-Financed Road Improvement Project in Colombia: The Pasto-Mocoa Highway*, consultant's report to the Inter-American Development Bank, Washington D.C., October 2011.

[181] Specifically, these areas include the bulk of the department of Nariño, which, together with the department of Putumayo, is expected to benefit from the improved road connection in economic terms, most of what is likely to be a more heavily traveled corridor between Mocoa and Bogotá, and most of the southern part of the Colombian Amazon region to the east of Mocoa and Puerto Asís, to which physical access will also be improved by the road.

influence of the project. Yet, possible road improvement-related impacts within them were not considered.

ii. While no explanation is given in Bank project documents as to why the proposed Strategic Environmental Assessment (SEA) was subsequently undertaken as a Regional Environmental Assessment (REA), this nonetheless suggests that some possible change in the scope and/or focus of this exercise may have occurred in relation to the original intention, with which the Bank apparently concurred, as it reportedly did with respect the definition of the "study region" for this assessment. Under such circumstances, the Bank should clarify in the pertinent project documents (e.g., the Loan Proposal for the alternate road project in the present case) any decisions that result in an apparent alteration of its original intent (and associated environmental and social assessment study ToRs), especially where interpretation of its environmental and social safeguard policies is concerned.

iii. In addition to questions regarding the spatial scope of the REA and the resulting environmental and social management plans, there also appear to have been substantive limitations on this exercise. Potential cumulative impacts on environmental quality, other than with respect to biodiversity -- for example with respect to water quality and soil degradation -- do not appear to have been considered. Similarly, potential social impacts seem to have been largely, if not totally, restricted to possible effects on indigenous communities. Possible project impacts on other low-income rural populations, including the *campesino* communities presently living in what is proposed as the new Protection-Production Forest Reserve through which the alternate road alignment is expected to pass, as well as elsewhere within the existing and proposed expanded Forest Reserve and the proposed Integrated Management District (DMI) near Mocoa, for instance, also appear to have been largely overlooked. These impacts may be of relevance, for example, to the extent that the new environmental protection and control measures to be implemented in connection with the project, such as those for enhanced biodiversity conservation, may also result in diminished access of some local populations to natural resources, including timber

and non-timber forest products and/or minerals, on which their livelihoods partly depend, thereby adversely affecting their future livelihoods.

iv. More generally, even leaving aside the areas outside the region that is the focus of the diagnostic studies contained in the REA, this document's description of the present nature of this area as a dynamic, complex, and problematic active resource frontier zone characterized by low governability suggests that it will be very difficult to effectively manage and control the additional development pressures, including those on local natural resources, likely to be induced by the road improvement project, together with other development interventions, especially outside those specific areas proposed to come under expanded and strengthened environmental protection. Under the circumstances described in the REA, in short, and given the "frontier" political economy character of the area surrounding the project, its basic conclusion that the effects of the project will be largely positive can be questioned, even assuming that the proposed biodiversity conservation and indigenous peoples protection measures are fully implemented, which is itself still to be determined, as project implementation is just now starting to really get underway.

v. This suggests that, as in the cases of Darién in Panama and Acre in the Brazilian Amazon described above, what is required is a much broader adequately funded longer-term regional development program, in which the road improvement is just one component. Among other things, such a program should include considerable strengthening of local public sector and civil society institutions, including departmental and municipal governments and NGOs, as well as effective land use controls, forest, biodiversity and other environmental protection measures, and the promotion of alternative sustainable livelihood activities for the affected populations similar to those being supported by the Bank along the Amazonian portion of the Interoceanic/IIRSA Sur Highway in Peru.

vi. Finally, this experience suggests the need to take a multi-sectoral spatial approach to development of the "economic corridor" formed by the west to east Tumaco-Pasto-

Mocoa-Puerto Asís axis as a whole – including the likely consequences of its intersection with IIRSA's north to south "Andean" corridor -- similar to the approach taken by the Asian Development Bank in the Greater Mekong Subregion in Southeast Asia.[182] Even if the Brazilian portion of this corridor is not considered for the moment, given that the fluvial connection with Puerto Asís does not appear likely to come to fruition in the immediate future, for future planning and environmental and social assessment purposes the Colombian section as a whole, as well as the possible increased commercial and other interaction with parts of neighboring Peru and Ecuador, should be considered. IIRSA, and the Bank – through its revitalized participation in the tri-partite Technical Committee to support this initiative, including its environmental and social due diligence -- as well as through its ongoing and future Technical Cooperation and lending operations in this part of Colombia and adjacent areas, can and should play a major role in this regard.

F. Project Implementation and Results

The Bank has had a number of examples of good practice with respect to the up-front strategic environmental (and social) assessment of the potential impacts of major road improvement projects in natural resource frontier regions that it has financed, is financing or, in the case of IIRSA Norte in Peru, supporting through a guarantee. It has also made substantial use of Technical Cooperation grants as part of project preparation in this regard and, in at least one instance -- the Pasto-Mocoa Alternate Road Project in Colombia -- has also contributed to an enhanced engineering design of the highway itself from an environmental standpoint. In some cases, such as the Santa Cruz-Puerto Suárez, IIRSA Norte and Pasto-Mocoa projects, however, the Bank has not fully reflected the findings and conclusions of these assessments or incorporated the associated recommendations of the resulting Environmental and Social Management Plans in the corresponding Bank loan or guarantee operations. In addition, some of these strategic assessments have not fully considered all the potential indirect and cumulative environmental and social impacts in the respective road improvement projects' larger areas of

[182] See John Redwood III, *Spatial Approaches to Sustainable Development: The Asian Development Bank's Role and Experience in the Greater Mekong Subregion, Its Relevance for the IDB and Possible Application in the Amazon Basin*, consultant's report, Washington D.C., July 2011.

influence, including possible transboundary ones -- such as on the Brazilian Pantanal in the case of the Santa Cruz-Puerto Suárez corridor operation -- while these areas of influence themselves have not always been clearly or consistently defined.

Even more important than the comprehensiveness and quality of the up-front impact assessments and the adequate translation of their recommendations into the associated management plans and project components, such as PMASIS in the Pasto-Mocoa case, or operations, like the Environmental and Social Protection Project for the Santa Cruz-Puerto Suárez Corridor, however, is the actual borrower implementation and Bank supervision of these components and projects in practice. Thus, good up-front environmental and social assessment work and proper project planning and design -- which includes full provisions to anticipate and address the potential direct, indirect, and cumulative impacts associated with major road improvement projects -- is a necessary, but not sufficient, condition from the standpoint of the ultimate effectiveness of such measures. In short, what is most important is what happens on the ground in advance of, in parallel to, and after the road improvement investments are themselves completed. And, as the Bank has appropriately recognized in the design and appraisal of the various road improvement projects reviewed in this survey, the timing and sequencing as well as the scope and geographic location of these environmental and social impact management and mitigation measures in relation to the road investments is critical, especially with respect to land use controls and their associated environmental and social repercussions, as was painfully learned ex-post in the Darién Sustainable Development Project.

Because the Pasto-Mocoa Alternate Road Project is just getting underway and the Bank is not directly financing the now completed Interoceanica and well-advanced IIRSA Norte operations in Peru, the balance of this section will focus on the implementation experience and some of the results of the Bank road projects in the Brazilian Amazon, Panama, and Bolivia, taking them again in chronological order. The observations and some of the lessons from the two Brazil and Panama projects are based on the respective Project Completion and other Bank reports, while those with respect to the Santa Cruz-Puerto Suárez road corridor, for whose road portion a PCR has not yet been issued and whose Environmental and Social Protection Project is still ongoing, are derived primarily from discussions with Bank operational staff who are very familiar with these operations. The critical importance of Bank supervision, monitoring and evaluation of these projects will be discussed in the following section.

1. The Porto Velho-Rio Branco Road Project

According to the PCR,[183] PMACI achieved most of its objectives and targets. This was attributed largely to the "decentralization" of project implementation responsibilities in order to involve the state government and local NGOs which occurred midway through project execution. Indigenous peoples' organizations received support, as did "management of their territory," indigenous health, education, productive activities, training and "identification of their lands," while local offices of the National Indigenous Peoples' Foundation (FUNAI) in Rio Branco and Porto Velho were also strengthened. Government and NGO performance with respect to territorial organization, environmental monitoring and inspection, forestry extension, and environmental education also reportedly improved; diagnostic studies were undertaken with regard to forest cover, deforestation, and other relevant themes; practices to recover degraded areas through the implantation of agro-forestry systems were encouraged, as were alternative proposals for the use of non-timber forest products. The protected areas subprogram permitted the creation of National Forests and gave particular attention to extractive reserves,[184] including physical demarcation of the Chico Mendes Reserve, which was legally established in early 1990,[185] and provided support to education, health and economic development programs for rubber tappers in both Acre and Rondônia.[186]

According to the PCR, the objectives and targets of the Definitive Action Plan (PAD) were maintained throughout the life of the project, but, with the decentralization of PMACI starting in 1990, there was a "wide revision" of specific activities in four of the five subprograms – only the territorial organization component remained largely unchanged – in order "to integrate and articulate them with other actions that were already being developed in the region." Pavement of the road was completed in 1992 – more than three years later than originally anticipated (although the PCR does not give the reasons for this delay), but PMACI was not

[183] See Inter-American Development Bank, Project Completion Report, for the Porto Velho-Rio Branco Road Project, op. cit. As noted above, this report only covered PMACI, and, thus, does not provide information on the road construction activities per se.

[184] Extractive reserves are publicly owned areas with long-standing populations who use the natural resources, such as rubber and Brazil nuts, on a sustainable basis. They began to be formally established as federal protected areas in October 1985 in response to a proposal drawn up by the National Rubber Tappers Council in order to avoid land conflicts with ranchers and other large land owners and invaders, especially in Acre and Rondônia.

[185] This extractive reserve was named in memory of the assassinated Chico Mendes. See footnote 15 above.

[186] IDB, PCR for Porto Velho-Rio Branco Road Project, op. cit., pp. 1-2.

concluded until May 1995, more than ten years after the project was approved, "in virtue of delays verified in the conception and implantation of the PAD."[187] The PCR does not indicate how long this delay was or exactly why it occurred, although it does refer to disagreements and overlaps between some of the participating federal agencies, as well as the previous inexperience of IPEA (the Applied Economics Planning Institute of the federal Ministry of Planning, that was initially to be responsible for project coordination) with the implementation of development projects, again without providing details. This situation was reportedly reverted once responsibility for coordinating PMACI was transferred to the then federal Secretariat of the Environment, which did not yet exist when the project was approved.

The PCR concludes that the original PAD became "obsolete" in many ways because of the elapsed time -- nearly three years -- between its elaboration and effective implementation and because it had been formulated on the premise that it would be executed exclusively by federal agencies, when, in practice, it was implemented largely by state and municipal government entities and NGOs. As it turned out, the significant increase in migration to the project area, which, based on the earlier experience in Rondônia, had been anticipated by the Bank's appraisal team in the mid-1980s, did not materialize for "diverse reasons," which the PCR does not describe. However, this fortuitous circumstance nevertheless facilitated a shift in PMACI's focus from managing the expected population inflow to promoting sustainable development of existing settlements, including the newly established extractive reserves.

The principal unanticipated result of PMACI, according to the PCR, was that the project would become "a model and example of intervention in Amazônia, assisting and stimulating local initiatives, with total support from the beneficiary communities, and articulating and integrating experiences with an eye toward sustainable development."[188] In the process, most of the entities that implemented specific projects, including the NGOs, were strengthened, leaving them with increased capacity at the end of the project to pursue their objectives and activities. The only initially proposed actions that were not implemented were establishment of an ecological station in Amazonas and an Environmental Protected Area (APA) in Acre due to lack of interest by the two state governments and despite the efforts by PMACI's coordination unit,

[187] Ibid., pp. 1 and 4. The two Bank loans were not formally closed, however, until March 1997.
[188] Ibid., pg. 6.

including offers of financial support and technical studies, to encourage the respective state environmental agencies to set up these facilities.

Lessons from this project, as drawn in the PCR and the Bank seminar in 1994, were summarized in the project design and preparation section of this report above and will not be repeated here, except to highlight the revealed need for flexibility on both the Borrower's and the Bank's part during project implementation in order to adapt to changing circumstances and unanticipated events, including with respect to the direct and indirect environmental and social impacts associated with major road improvements. Thus, an "adaptive management" approach is strongly recommended in all large Bank-financed infrastructure projects, especially in natural resource rich frontier regions and with respect to their environmental and social components, as such regions are frequently subject to rapid, significant, and often unanticipated changes over time. A second additional lesson refers to the expected time required to implement both road improvement and associated complex environmental and social impact management and development projects in such regions, even when project management responsibilities are appropriately decentralized, as occurred during the execution of the Porto Velho-Rio Branco Road Project, and, in particular, of its PMACI component.

In all of the projects reviewed, moreover, as occurred in the Porto Velho-Rio Branco case, planned road improvements in tropical frontier regions have taken considerably longer – and cost considerably more – than initially anticipated by the Bank for a variety of reasons, which will be further discussed below. As observed above, this has significant implications for the actual economic rate of return on such investments, which in reality may be substantially lower than initially estimated due both to the higher – in some cases, considerably higher – actual costs and longer – often much longer – project implementation periods, thereby also lengthening the time gap between when the higher than projected costs are incurred and the associated benefits are perceived, when compared with (*de facto* overly-optimistic) appraisal estimates. Both of these factors have a negative impact on the cost-benefit ratios estimated at appraisal. Thus, in addition to a more conservative initial cost-benefit analysis accompanied by very elastic sensitivity analysis, the Bank should also systematically evaluate the economic feasibility of such – in fact of all -- projects *ex-post*, using the actual observed costs and implementation times.

2. The Darién Sustainable Development Project

In addition to two PCRs,[189] this operation was the object of a final external evaluation.[190] Actual project costs turned out to be US$ 125.7 million, representing a nearly 43 percent overrun in relation to the appraisal estimate of US$ 88 million and a 15 percent overrun in relation to the re-estimated total project costs (US$ 109 million) at the time the supplementary loan was approved in June 2007. Most of the additional costs were for the road rehabilitation component, which consumed slightly more than half of all project resources (and 56 percent of the Bank loan), nearly doubling from an appraisal estimate of US$ 33 million to an actual cost at completion of over US$ 63.2 million, representing an increase of 92 percent. Project administration and (Borrower) supervision costs also rose by 85 percent – from US$ 6.1 million to US$ 11.3 million – over the project implementation period. In contrast, actual costs for the land organization and environmental protection component at completion, at just over US$ 9 million, turned out to be only two-thirds the original appraisal estimate (US$ 13.4 million) and final costs for the institutional strengthening and sustainable production components were also lower than initially anticipated.[191] The project likewise took six years longer to implement than originally expected, according to the evaluation report without going into detail, primarily because of reasons associated with "annual budget allocations." Central government changes also played a role, as the project was prepared during one administration and finished three administrations later[192] while the project itself underwent a change in executing agencies in January 2005.

The evaluation report concluded, however, that the "resources invested by the State through [the project] (US$ 125.7 million between 1998 and 2010) definitely have had positive, significant and demonstrable results and impacts on the quality of life of the population of Darién, in accordance with the objectives set out in 1998." In support of this assertion, it states that the poverty indicator for Darién had decreased from 71.9% in 2003 to 52.7% in 2008 and the

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[189] Inter-American Development Bank, *Informe de Terminación de Proyecto (PCR) Programa de Desarrollo Sostenible de Darién*, July 30, 2009, and Inter-American Development Bank, *Informe de Terminación de Proyecto (PCR) Financiamento Suplementario para el Programa de Desarrollo Sostenible de Darién*, June 23, 2011.

[190] Republica de Panamá, Ministerio de la Presidencia, Consejo Nacional para el Desarrollo Sostenible (CONADES), *Evaluación Externa Final del Programa de Desarrollo Sostenible de Darién PDSD – Informe Final*, prepared by OTSCORP, SA Optima Technical Services, SA), Panama, June 2011.

[191] Ibid., Executive Summary, pg. vi.

[192] There were changes in government in September 1999, September 2004, and September 2009. The project was prepared and Bank financing approved in 1998 and its final evaluation occurred in December 2010.

extreme poverty indicator in the province had fallen from 50.1% in 1997 to 21.2% in 2008. In addition, the Human Development Index (HDI) for the Comarca and Province of Darién had improved by 18.6% and 16.7% respectively between 2001 and 2007, compared with an improvement of 5.4% for Panama as a whole over this period. According to the report, these improvements "were due in good measure to the investments in basic services and to the increased economic activity generated by the pavement of the Pan American Highway, as had been expected."[193]

The project undoubtedly contributed to these improvements. However, the evaluation report itself does not provide sufficient evidence to prove that the observed reduction in poverty levels and improvement in the HDI in the province during the years considered were, in fact, primarily the result of project-financed basic services, nor does it demonstrate the extent to which increased economic activity was actually the result of pavement of the road, as opposed to other, non-project, including favorable macroeconomic, factors, or, more likely, some combination of the two. This would require a more systematic assessment of the links between specific project investments and induced economic activity in the province and its internal distributional/poverty impact, as well as with respect to specific project investments in basic services and the presumed improvement in the individual social indicators that compose the HDI, among other analyses that were not undertaken as part of this evaluation. Nor does it take into account other investments and interventions by both the public and private sectors that may have contributed to these positive changes in poverty levels and the HDI values for Darién over the course of the project period.

Thus, there is a serious "attribution" problem with these assertions – i.e., the extent to which the improvements in poverty levels and the HDI can actually be attributed to the actions taken under the project, as compared with other (i.e., non-project) factors and interventions, cannot be readily determined. The report does observe, however, that "despite these accomplishments, Darién and the [indigenous] *comarcas* are still among the poorest regions in Panama." And it states that, "[while the project] has demonstrated the feasibility of achieving significant impacts in a region…it is necessary to continue these efforts." More significantly – and also more worrisome -- from a sustainable development perspective, it affirms that project

[193] Ibid., pg. vii, emphasis in the original.

achievements with respect to the protection and sustainable use of natural resources were "less impressive."

Nor was it possible to conclude that "the agricultural frontier had stabilized" since "cattle ranching has had a rate of increase 10 times higher than the average for the country and the area in pastures has increased above the area considered appropriate for this use; land conflicts have grown; the tendency for intervention in protected areas has improved slightly but some of them have decreased in area and others…are no longer 'protected areas;' the land titling has been a success as a judicial instrument but its social and economic impact is questionable, as the small land occupiers have not been converted into owners and farmers as was expected and an intense land speculation process has been generated." The evaluation report goes on to add that "at the actual land prices along the Pan American Highway, small-scale agriculture is not financially viable" and "land prices have increased more than five times in relation to 1998."[194] Thus, it would appear that one significant direct impact of paving the road – which should not have been unexpected by the Bank given its earlier experience in Acre, where this was specifically identified as a project risk -- was to increase land prices in its immediate area of influence and, in all likelihood, drive out rather than help to consolidate the settlement of existing low-income rural inhabitants.

The evaluation nonetheless concluded that the project made "important progress with respect to its general objectives, especially in improving the welfare of Darién's population, but it did not achieve its full potential." These shortcomings, according to the report, were due in good measure to three factors: (i) some objectives were not feasible or realistic; (ii) the complexity of the implementation scheme and government management; and (iii) to a lesser extent, the performance of the Executing unit. With regard to the first factor, it noted that the objectives of the sustainable production support component were "very difficult" to achieve because they depended to a large degree on national agricultural sector policies that limited the financial feasibility of sustainable production in the province, while the "social objectives" with respect to land titling were not realistic to the extent that it was expected that the beneficiaries would then dedicate themselves to stabilizing their situation as small farmers instead of selling their lands and that adequate regularization of extractive activities based on the regional

[194] Ibid., pp. vii-viii.

economy (such as forestry and fishing) was not viable in the prevailing political and institutional context.

As concerned the second factor, application of various instruments considered essential in project design, such as the land use management plan and the environmental and social sequencing of project interventions, among others, which sought to strengthen integration among project components and subcomponents and to guide the spatial and temporal implementation of project activities, in practice proved not to work well in the "centralized structure of the public sector." And, in the case of the third factor, the PCU was unable to overcome the aforementioned obstacles to better inter-institutional coordination, which was considered "critical" for overall project success.[195] A summary of the results of the more specific evaluation of each of the project's major components is contained in the respective case study report.[196] In partial synthesis, according to the evaluation report:

> Pavement of the Pan American Highway…has fully achieved the expected results and impacts, even though at a greater cost than projected due to the implementation problems. For the rest of the [transport] subcomponents (ports, airports, and other roads) the results and impacts are not evident…The access roads are probably stimulating land occupation without improving agricultural production…The lower transport cost for the forestry sector has encouraged [timber] exploitation in less accessible areas, but precisely to mitigate this impact the components for land management and institutional strengthening of ANAM [the National Environmental Agency] were formulated. On the other hand, the paving of the Pan American Highway, together with land titling, have contributed to the increase in land prices along the road and to the current process of land speculation and tenure concentration, for which the regulatory measures have been weak.[197]

Other important, more general, conclusions of the evaluation with respect to project results and impacts and its effect on recent development trends in Darién were:

- The dynamics generated in the commerce of land as a direct effect of the road and the process of land cadastre and titling are creating the conditions for the agricultural

[195] Ibid. pg. 4. My translation.
[196] See John Redwood III, *Managing the Environmental and Social Impacts of a Major Bank-Financed Road Improvement Project in Panama,* op. cit.
[197] Republica de Panamá, *Evaluación Externa Final del Programa de Desarrollo Sostenible de Darién PDSD – Informe Final,* op. cit., pp. 51-52. My emphasis.

frontier, in this case the cattle frontier, to continue to expand. This tendency is explained as part of a slow but irreversible process of soil degradation: in the production zones denominated for sustainable development by the Land Use Management Plan, the cadastre and titling incentivized cattle raising activity, in clear conflict with the land use capacity. The underutilization of zones apt for pastures still exists while those that have the aptitude for intensive agriculture, forest uses, and permanent crops are being dedicated to grazing.

- There is partial evidence concerning the intervention in the Protected Areas….Information limitations do not permit a clear picture of the status of all the protected areas in the province, but that available…indicates the persistence of processes that not only obey the expansion of the agricultural subsistence frontier but also the sale of properties for the purpose of extensive cultivation.

- In the opinion of residents of the province, the deforestation process has not stopped, the weakness of ANAM continues to be one of the factors that contribute to the uncontrolled extraction of timber and the most recent forest policy has not had any effect because it did not address problems that had been repeatedly identified. The province of Darién lost forest at 1.6 times the national average between 1992 and 2000...For the 2001-2008 period, this tendency has continued in the areas outside the [indigenous] *Comarcas* and Darién National Park.

- In summary, although the first point is not fully substantiated analytically, it can be concluded that: (i) the program met its objective of improving the welfare of the population of Darién with respect to the national averages even though it continues to be among the poorest regions in the country; and (ii) with respect to the objective of protection and sustainable use of the natural resource, in particular stabilization of the expansion of the agricultural frontier, the exploitation of coastal and marine resources, the intervention in protected areas and the tendency for deforestation, the achievements have been modest, the expected stabilization has not occurred even though the tendency for deterioration has been reduced in some cases, and the

impacts of land titling have not been those that the program hoped for with respect to the sustainable use of natural resources. The project did not achieve all its potential and would have had more significant impacts if it had had better implementation results and had complied with the conditions stipulated in the logical framework.[198]

Among the conclusions and lessons that can be drawn from this experience are the following:

i. The project took an innovative approach to anticipating and attempting to address the potential adverse impacts of a major road improvement investment by incorporating it in a broader multi-sectoral regional development operation, which ambitiously sought at the same time to boost economic development, alleviate rural poverty, and protect biodiversity and other renewable natural resources. The request for supplemental financing later observed, however, that it would have been better if the Bank had supported this program through a multi-phase set of projects with the first one seeking to implement the preconditions in terms of environmental and social protection, including the necessary institutional strengthening, and the second financing pavement of the highway and other infrastructure improvements, once essential land use controls and other environmental and social management measures were firmly in place.

ii. Perhaps the most important general lesson of this project experience, however, is that no matter how well a complex operation such as the present one is designed and prepared, what ultimately matters is how – and how well -- it is implemented. As a corollary to this, it is necessary both to understand well the political-economic and institutional context and dynamics in which the project will be carried out and to be able to react quickly and adapt effectively when unanticipated events and impacts occur.

iii. As noted above, complex projects like this one, and even simpler operations in challenging environments such as Darién, can – and frequently do -- take far longer

[198] Ibid., pg. 75. My emphasis.

and cost substantially more to implement than initially anticipated. However, the combination of a multi-faceted project in a complex and dynamic environment will almost certainly experience both implementation delays and cost overruns, for which governments and international financing agencies such as the Bank must be prepared in advance. Implementation delays are also particularly likely to occur – as was the case with the present project – when more than one national government administration (often involving different political parties and priorities) is involved. As also observed above, such unanticipated delays and costs have significant (negative) implications for the ultimate economic viability of such investments and, thus, should always be reassessed upon project completion.

iv. Unexpected – even it anticipatable – adverse impacts of major road improvement investments – such as the rapid rise in rural land values and prices, significant land use changes, and increasing land concentration in their areas of influence, as in the present case – can "derail" other project efforts to achieve strategic objectives, such as "stabilizing the agricultural frontier," "fixing" small farmers to the land, and protecting areas that are rich in biodiversity, often with perverse environmental and/or social consequences.

v. More generally, as all of the projects reviewed in this survey have demonstrated, major road improvements in less developed agricultural and natural resource frontier regions are likely to have significant direct and indirect environmental and social impacts in their direct and indirect areas of influence. These impacts need to be anticipated and assessed up-front to the extent possible and appropriate plans to avoid, minimize, mitigate and/or compensate for them need to be carefully developed and properly implemented. Implementation of many of the necessary environmental and social management and protection measures needs to take place prior to undertaking the road improvements per se. Controlling land ownership, tenure and use and protecting biodiversity and indigenous populations and other vulnerable social groups (e.g., Afro-descendants, small subsistence farmers, etc.) in the immediate and more remote areas of influence of the proposed road improvement will

be particularly important in this regard and should be a priority in the associated environmental and social management plans.

vi. In view of the above considerations, the multi-phase approach recommended in the Bank's loan document for additional financing for the Darién would clearly appear to be the most sensible way to proceed – i.e. to ensure that the required land management and other safeguard measures are firmly in place in advance of any major road improvement. This is also important because physical investments, such as the construction or upgrading of transport infrastructure, especially major roads, while perhaps challenging from an engineering standpoint, nevertheless tend to be easier to implement – and generally also count with much stronger local and national political support – than "softer" and politically more difficult interventions such as land use planning, regulation, and control, support to pro-poor productive activities, and environmental and social protection and management measures more generally, especially those involving global public goods such as biodiversity or vulnerable ethnic and other minorities who also tend to be among the poorest local residents. This clearly occurred in the case of the World Bank-financed Polonoroeste program in the 1980s when pavement of the BR-364 between Cuiabá and Porto Velho was implemented much more rapidly than other program components, including both those for agricultural development and for environmental and social protection,[199] and also happened but, fortunately with far less disastrous environmental and social consequences, in the case of the Porto Velho-Rio Branco road project financed by the IDB and, as will be shown further below, in the Bank-financed Santa Cruz-Puerto Suárez Corridor Program in Bolivia.

vii. Multi-sectoral regional development projects like the present one need to be supported by appropriate national and sectoral policies. And mechanisms to adequately direct and coordinate multiple public institutions in different sectors and at

[199] See John Redwood III, *World Bank Approaches to the Environment in Brazil*, op. cit.

different levels of government need to be in place and need to function effectively throughout project implementation.

viii. A number of important "loose ends" and "unfinished business" from the now completed project remain to be addressed in Darién, which continues to be comparatively poor and to suffer from insufficient protection of its rich biodiversity and inadequate support to its vulnerable indigenous and other low-income inhabitants in both rural and urban areas, which are still under (partly improved road-induced) pressure from other economic and social forces. In short, the sustainable development challenge still remains and may, in fact, have become even more difficult and complex now that the paved Pan American Highway is in place at least part way through the province. The Bank should, thus, seek to continue to help the national and local governments in the province, in close consultation and collaboration with the affected communities, to move forward in its efforts to achieve environmentally and socially sustainable development.

Finally, such continued support will be even more important should the Pan American Highway eventually be extended further to the east and south passing through what is known as the "Darién Gap" all the way to the border with Colombia, which would thus connect North, Central, and South America by road, and even further enhance and exacerbate the road's direct and indirect economic, environmental, and social impact in the province. This sparsely inhabited area, moreover, is even more sensitive from both a biodiversity and a socio-cultural standpoint.

3. The Acre Sustainable Development Program

Implementation of this project took four years longer than originally anticipated.[200] It also cost considerably more than originally anticipated due to a significant increase in road paving costs, which more than doubled from an estimated US$ 33.4 million to US$ 76.7 million. This increment was financed in part through reallocation of Bank loan funds from other components and subcomponents of the project and, to an even greater extent, with an injection of additional

[200] Inter-American Development Bank, *Relatório de Término de Projeto – Programa de Desenvolvimento Sustentável do Acre*, Brasília, October 29, 2010.

resources from the Brazilian Federal Government's Growth Acceleration Program (PAC), which was launched in 2007. The cost increases are attributed largely to delays in the initial procurement of works for the road pavement, which, in turn, were apparently due primarily to the fact that the final design studies revealed the need to bring all of the basic construction materials to the project area by river from Manaus together with "the much more stringent construction requirements in an area in Amazônia that is flooded during half of the year."[201] The difficulties involved in paving a road segment that crossed several rivers were also a significant factor, although these difficulties should have been foreseen at the time of appraisal. Start-up delays were also reportedly caused in part by a "constant rotation" of staff in the State's project team.

The project likewise faced a challenge in promoting entrepreneurism, "initially in demonstrating to small farmers and ranchers the importance of adding value to their products and because, in some local agencies, some of the technical staff with a very traditional profile lacked relevant experience in business promotion." There was also limited demand at first for business promotion services and this activity was reportedly given lower priority by the implementing unit, which, additionally, faced difficulties in accompanying some project objectives and indicators because the state lacked a specific agency with the responsibility to do so, while some initial targets were over-dimensioned. Finally, among the factors that negatively affected project implementation, there was an increase in the incidence of forest burning in the state in 2005 due to the longest drought period in 30 years, which was exacerbated by local slash-and-burn land clearing practices that increased the number of fires well beyond the capacity of firefighters and the pertinent state agencies to control them.

These delays and problems notwithstanding, the PCR judges project outcomes to have been largely "satisfactory" and, as previously observed, attributed much of the operation's success to its "methodology…whose key was the strictly respected sequencing of interventions," and the existence of strong political commitment on the part of the state and municipal governments.[202] Robust growth of the national economy starting in 2005, "which favored increased incomes of project beneficiaries and made possible the availability of additional

[201] Ibid., pg. 14. The PCR suggests that somehow these contingencies had been overlooked in the preliminary design studies for the road section to be paved upon which the initial cost estimates were based.
[202] Ibid., pg. 13. My emphasis.

federal resources through the aforementioned PAC that allowed the project to mobilize a much higher level of counterpart funds than initially anticipated," was also cited as an important contributing factor. As concerned potential risks to the sustainability of project outcomes, however, the PCR observes that, while "the strong tendency of cattle ranchers to curb deforestation, in many cases, incorporating new forestry activities in a farming-ranching-forestry system, has contributed significantly to the reduction in deforestation," any change in this pattern could lead to a reversal in this regard. [203]

The PCR does not specifically report on the implementation and results of the project's environmental and social monitoring and mitigation measures taken in connection with pavement of the additional 70 kilometers of the BR-364 road, but a "final evaluation" of the project carried out by a consulting firm in 2008-09 reportedly included an assessment of the social and environmental impacts of the works and actions implemented under the project and how they were managed.[204] However, there is nothing specific in the project files in this regard, and the Bank's office in Brasília has not been able to locate any written output from the firm that specifically assesses the project's environmental and social impacts and how they were addressed. The head of the firm that carried out the evaluation nonetheless affirmed verbally to the Bank's Brasilia-based team leader that its assessment as to how project environmental and social impacts were handled was positive and emphasized that the key innovation consisted of the two UGAIs ("Management Units") that were set up at either end of the road segment to be paved as part of the social and environmental protection measures. Even during the construction years, when these inspection posts were operational and had to be vigilant not only with respect to deforestation and forest fires, but also the direct impact of 600 workers near poor and indigenous communities, where specific risks had been identified for prostitution and disease transmission, the UGAIs apparently functioned effectively and not a single incident was reportedly detected. Even though the PCR itself does not provide specific information in this regard, it does register many of the other project outputs and outcomes.[205]

Finally, the PCR highlighted several important lessons, some of which have already been touched on above, including: (i) applying the concept of environmental sustainability in all the

[203] Ibid., pg. 15.
[204] Tellus Consultoria SA, *Programa de Desenvolvimento Sustentável do Acre – Relatório de Avaliação Final*, Rio Branco, December 2009.
[205] These results are summarized in the table on pages 8-12 of the PCR and will not be repeated here.

actions of the Program, with participation of all the affected stakeholders, demonstrated definitively that, even in Amazônia, it is possible to invest in transport infrastructure without increasing deforestation; (ii) the key to the change in behavior of producers and residents in a rural area in this region is to demonstrate the socio-economic advantages of sustainable production at the same time that [environmental] monitoring and control continue;[206] (iii) before making a decision to finance a Program of this nature and to begin the process described above, it is necessary to demonstrate the existence of a high degree of political commitment; (iv) an undertaking as ambitious and innovative as the present one could not be implemented in a period of four years as originally anticipated; (v) preliminary road engineering design studies are insufficient in the challenging context of Amazônia which requires final studies; and (vi) the Results Framework of the project should not contain associated targets in the absence of a concrete baseline and well-defined indicators for which data can be easily obtained.[207]

4. The Santa Cruz-Puerto Suárez Road Corridor

The road improvement project in the Santa Cruz-Puerto Suárez Corridor (B0-0036) has recently been completed, but a PCR had not yet been issued as of December 2011, while the Environmental and Social Protection Project (B0-0033) is still under implementation. So, it is not yet possible to speak of definitive results, other than that the road improvements financed by the Bank have now been finished and this also appears to be the case with respect to the sections whose pavement was financed by CAF and the EC. It is possible, however, to describe the complex and problematic implementation experience of the two Bank projects as it has evolved to date, based on discussions with Bank staff directly involved in the supervision of BO-0033.

Both external observers and recent Bank supervision missions have pointed out significant problems with implementation of the Santa Cruz-Puerto Suárez corridor road

[206] It adds that "the sequence should begin with the reliable mapping of communities and their cadastral situation as the initial approach to the communities in each area, followed by a genuine dialogue with the beneficiaries, with proactive inclusion of traditional and indigenous communities. The presence on the ground of a normative and control agency like IMAC [The Acre Environmental Institute] is essential to continue the process of delimiting areas to be protected, authorizing and controlling [land] use, and ensuring that communication continues. At the same time, the [land use] control activities have to be undertaken in collaboration with agencies that can transfer technology and promote businesses that can demonstrate alternatives that bring higher incomes, taking advantage of the new context of sustainable production."

[207] Ibid., pp. 16-17. Other lessons contained in the PCR refer to up-front analysis of the need for a management firm for the project, the need for "pump priming" or initial stimulation of new private businesses, and the importance of involving civil society and the academic community in the dissemination of lessons learned.

improvements and environmental and social protection projects. One external source, for example, has criticized both the Bolivian Government and the Bank for a lack of transparency – including falling short in terms of earlier commitments to grant the public adequate access to information -- in reporting on the project and for insufficient accountability in the management of some of its environmental and social impacts, especially those involving certain indigenous communities, thereby representing potential alleged human rights violations.[208] IDB supervision missions for the Environmental and Social Protection Project in April 2010 and February 2011 also identified implementation-related shortcomings in terms of the Borrower's and the Bank's management of the environmental and social impacts of this project,[209] as has an independent social and environmental audit of this operation, whose most recent report covered the second semester of 2010 and first semester of 2011.[210]

The project was initially subject to considerable delays in meeting the effectiveness conditions for BO-0033 and, thus, initiating road improvement works under BO-0036, as well as to significant institutional changes after President Evo Morales took office in 2006, leading both to further delays and several alterations in project administrative arrangements, which ultimately required three separate amendments to the Bank legal agreements. The first such alteration occurred in late 2004/early 2005, when the executing agency for the project was decentralized from the Ministry of Sustainable Development and Planning (MSDP) in La Paz, as per the original legal agreement signed in 2002, to the Prefecture of the Department of Santa Cruz (PDSCZ), with a corresponding change in the location of the Project Executing Unit (UEP) from the former to the latter.[211]

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[208] See a March 2010 article by Katu Arkonada and Henkhan Laats of CEADESC (or the Center of Applied Studies on Economic, Social, and Cultural Rights) entitled *Transparencia, Un Desafio en la Construcción de Megaproyectos: El Caso de La Carretera Puerto Suarez-Santa Cruz en Bolivia*, reproduced by the Bank Information Center (BIC), a Washington-based watchdog NGO that gives particular attention to environmental and social impacts and management of investment projects financed by multilateral financial institutions such as the World Bank and IDB.

[209] IDB, *Bolivia: Protección Ambiental Social Santa Cruz-Puerto Suárez – Informe de Supervisión Ambiental*, April 2010 and *Bolivia: Misión Ambiental Especial – Reporte de Misión*, February 2011.

[210] POYRY Infra AG, *Proyecto de Protección Ambiental y Social del Corredor Vial Santa Cruz-Puerto Suarez: Auditoria Social Y Ambiental Independiente – Informe Parcial de Segunda Auditoría Ejecutor Directo UEP Segundo Semestre 2010 – Primer Semestre 2011*, September 2011.

[211] See IDB, *Contrato Modificatorio entre la Republica de Bolivia y el Banco Interamericano de Desarrollo – Proyecto de Protección Ambiental y Social en el Corredor Santa Cruz-Puerto Suárez*, signed by the Manager of Region 1 on behalf of the Bank on December 7, 2004 and by the Ministry of Finance of Bolivia on January 10, 2005.

The second modification occurred in February/March 2007 and changed implementation responsibilities for the Replacement of the Prevention and Mitigation Plan (PPM) and the Environmental Application and Monitoring Plan (PASA) subprojects from the National Road Service (SNC) with the participation of INRA (the National Institute of Agrarian Reform) and the Prefecture of Santa Cruz to the Bolivian Road Administration (ABC) with participation of the same two agencies mentioned in the original contract. It also made ABC, instead of SNC, the executor of the Archaeological and Cultural Patrimony Protection subproject with participation of the National Direction of Archaeology of the Ministry of Economic Development (MDA/DNA) -- instead of the National Unit of Archaeology of the Ministry of Education, Culture and Sports (NEDC/UNAR) -- and of the Information, Social Interaction and Environmental Supervision subproject, while the Environmental Inspection and Control of the Road Project remained the responsibility of the Departmental Direction of Natural Resources and Environment of the Prefecture of Santa Cruz.[212]

The third modification came in October 2009, which made ABC and INRA direct co-executors of the operation together with the Prefecture of Santa Cruz, rather than subordinating the parts of the project for which the two former agencies were responsible to the latter, as had previously been the case. Project administration was, thus, effectively split into three. As a result, INRA took over direct responsibility for implementation of BO-0033's Land "Sanitation," Titling, and Registration subproject and ABC took over direct responsibility for the aforementioned Replacement of Losses, Archaeological and Cultural Patrimony Protection and Information, Social Integration and Environmental Supervision subprojects, while the Prefecture of Santa Cruz continued to be directly responsible for the Environmental Protection, Institutional Strengthening and Sustainable Municipal Development, Communication, and -- together with the *Fondo Indígena* in collaboration with numerous local indigenous peoples' organizations -- Indigenous subprojects. Responsibility for the Environmental Inspection and Control of the Road Project would also remain that of the Prefecture of Santa Cruz through the redenominated Competent Departmental Environmental Authority (PDSCZ/AACD). The third amendment to the loan contract also extended the implementation period for most of the BO-0033 subprojects

[212] See IDB, *Contrato Modificatorio No. 2 entre la Republica de Bolivia y el Banco Interamericano de Desarrollo – Proyecto de Protección Ambiental y Social en el Corredor Santa Cruz-Puerto Suárez*, signed by the Manager of Region 1 on behalf of the Bank on February 2, 2007 and the Minister of Development Planning of the Bolivian Government on March 7, 2007.

to the end of December 2011 rather than for the four and a half years following signature of the original contract, as had been stipulated in that document.[213]

More generally, the two Bank projects, and especially BO-0033, were caught up in the increasing political struggles and significant differences between the Morales Government, which gave priority to the nationalization of important national assets and indigenous peoples' rights in the much poorer Bolivian highlands, and local development – and separatist -- aspirations in the more prosperous lowlands centered around the city of Santa Cruz, outward from which the agricultural frontier was rapidly expanding, and that nearly led to Bolivia splitting into two. As a consequence, other parts of the road improvement program, particularly the segments financed by CAF, which were not subject to the same environmental and social management conditions as the IDB-financed sections, moved ahead much more quickly than that to be financed under BO-0036, which was legally contingent upon the prior effectiveness of and Government compliance with legal conditions for BO-0033. In addition to implementation delays in the Bank-supported projects, the sharp political differences between the central and departmental governments led to significant budget, including counterpart funding, restrictions, which only further exacerbated the implementation problems and eventually resulted in considerable Government pressures on the Bank to relax the legal obligations linking implementation of the road improvement works to the conditions in relation to BO-0033, to which the Bank eventually submitted. This crucial contractual requirement was apparently waived by the IDB resident representative in Bolivia at the request of the Government at some point without the prior knowledge of Bank safeguards staff, thereby effectively delinking implementation of the two projects from a legal standpoint, which had been a crucial element in their original design.

Other factors that have significantly affected project implementation include the need to change the surface of the road, from concrete to asphalt, as a result of the Bolivian Government's blockage of soybean exports from Santa Cruz to Chile, as part of the broader political dispute between the departmental and central governments. Originally, the project was expected to import cement from Chile to take advantage of the return of empty trucks taking soybeans to

[213] See IDB, *Contrato Modificatorio No. 3 entre la Republica de Bolivia y el Banco Interamericano de Desarrollo – Proyecto de Protección Ambiental y Social en el Corredor Santa Cruz-Puerto Suárez*, signed by the Ministry of Development Planning of the Bolivian Government on October 22, 2009 and the Bank's Representative in Bolivia.

Chile, but when this possibility was impeded by the central government, it was no longer cost-effective to use concrete for the pavement, which was then switched to asphalt. In addition, the US$ 3 million in co-financing from the Nordic Development Fund that had originally been part of the project's financing plan, mainly to support the Land "Sanitation," Titling and Registration subproject, was considerably delayed, thereby also resulting in a substantial delay in implementation of this component. This was later partially rectified by redirecting some of the resources under the Bank's Land Regularization and Legal Cadastre Project (BO-0221), whose loan for US$ 22 million was approved in December 2003, with INRA as the executing agency, to the project area. A third critical complicating element was that, due to the aforementioned delays in the implementation of BO-0033, CAF decided to finance some of the local assets that had been lost as the result of the improvement of its portion of the Santa Cruz-Puerto Suárez highway, but which were originally to have been financed under the Replacement of Losses subproject of the IDB project. However, these facilities are apparently of poor quality and not up to the IDB's standards, thereby requiring additional remedial actions on the Bank's part.

As a result of these and other accumulated delays and shortcomings, the Bank's April 2010 supervision mission reached a number of troubling conclusions about the status of project execution, including that the Road Corridor (BO-0036) and Environmental and Social Protection (BO-0033) Projects were, in practice, being managed independently rather than as closely linked interventions which had been the Bank's intention as clearly manifested both in the respective Loan Proposal documents and legal agreements. In this regard, the mission affirmed that there was a need to correct the situation by conditioning future loan disbursements for the road project to satisfactory implementation of BO-0033, as had been foreseen in the respective legal documents. More generally, the mission concluded that the project was in violation of the Bank's legal requirements in a number of ways, including with respect to the contracting of an independent environmental and social audit, which had still not occurred, and failure to satisfactorily execute key environmental mitigation and land regularization components of the Environmental and Social Protection Project, among others.[214]

This was, in fact, the third such environmental and social supervision mission carried out by the Bank. Its report also stated that it was possible to confirm that "various of the direct and

[214] See April 2010 supervision mission report, pg. 7.

indirect social and environmental problems generated by the Project had become persistent and were being systematically repeated without an adequate response by the executors." For this reason, the planned environmental and social audit was necessary in order to "identify and inventory all the impacts, deficits, and risks (including both those originally foreseen and not mitigated and new ones that have occurred as a result of the non-implementation of the management plans) and to propose concrete solutions." The report likewise concluded that the Bank's "routine supervision" of the projects had been "insufficient and not capable of anticipating adverse situations, nor reacting in a timely way when they arise, thus requiring the adoption of more intense supervision mechanisms" by both Bank transport and safeguards staff. Finally, it observed that, "even though the Bank's current environmental and safeguard policies had not yet gone into effect at the time these two interrelated projects were approved, when their current implementation situation was compared with the requirements of these policies, the operations were not in full compliance with any of them, nor with the project-specific environmental and social management plans."[215]

This supervision mission also identified the same shortcomings regarding public information and consultation identified by the external observers cited above, concluding that "non-implementation of the participation mechanisms foreseen for the program has exacerbated the dissatisfaction of the affected populations and weakened its self-management capacity." The mission made a number of recommendations to help address the problems encountered, including the needs to: (i) update the road project's environmental license; (ii) improve the management of wetlands, protected areas, and special interest sites; (iii) speed-up restoration works; (iv) improve mechanisms to attend to the concerns of the affected, including indigenous, populations; (v) seek additional resources for these purposes, and (vi) "relink" disbursements for the road improvement project to the satisfactory implementation of the environmental and social protection operation,[216] which, however, did not occur.

The February 2011 supervision mission confirmed that, even though the independent environmental and social audit had finally been contracted in June 2010, there were still a number of "matters of preoccupation" with regard to project implementation, including "execution of the land titling component without any coordination with the municipalities, which

[215] Ibid., pg. 7.
[216] Ibid., pp. 15-16.

could cause incompatibilities when the municipal rural [land] cadastre is generated," among others.[217] In addition to observing that coordination needed to be improved in this regard, the mission recommended increasing project resources to support new productive initiatives for indigenous peoples and to expand the coverage of the urban cadastres in the municipalities along the road corridor, as well as to seek ways to simplify procurement procedures in order to facilitate – and thus accelerate -- the acquisition of smaller items, which had represented a significant bottleneck in the past.[218]

The independent environmental and social audit report for July 1, 2010 through June 30, 2011 was undertaken by an engineering firm based in Zurich, Switzerland with a local representative in La Paz. The auditors' overall assessment regarding implementation of planned project activities, including that of the "indigenous program," during the period under review, was positive. However, as concerned the environmental conservation program, they noted that delays in the initiation of both the protected areas and forest conservation subprograms had resulted in the slow implementation and management deficiencies that had been witnessed during their first visit (in August 2010), and were reflected in the "slight involvement and participation of the co-executors," SERNAP and the Forest and Land Inspection and Social Control Authority (ABT), respectively, although the situation had "substantially improved" more recently. Both of these agencies, moreover, had expressed a concern with the future continuity and sustainability of the actions financed by the Bank loan. Similarly, start-up problems had occurred with the institutional strengthening and sustainable municipal development program, which had also resulted in delays and management shortcomings, due in part to "political instability" in some of the participating municipalities in the project area and also leading to implementation difficulties. However, this situation had reportedly also improved and it was now expected that the corresponding subprojects would be "executed normally" until project conclusion. [219]

With respect to the environmental inspection and control of the road project, in turn, the audit concluded that good management capacity was in place. But it also observed that responsibility to solve the problems encountered was still vested in the Socio-environmental

[217] See February 2011 environmental supervision report, op. cit., pg. 1.
[218] Ibid, pg. 13.
[219] Poyry Infra, op. cit., pp. 35-36.

Supervision (SSA) Division of ABC, the executing agency of the road improvement project, but there was need to accelerate the flow of pertinent information to ensure it arrived at SSA and the UEP to guarantee "clear channels of authorization and timely issuing of permits in order not to create obstacles for the construction chronograms and timelines, and to allow that the required permits are always issued before the works start." The auditors likewise noted that, even though coordination between the environmental supervision of the UEP and the Secretariat of Natural Resource Development and Environment of the Autonomous Departmental Government of Santa Cruz had improved, this relationship should be "further strengthened in order to establish the sanctions foreseen in the applicable environmental legislation and norms, when the risks and environmental impact situations require them." Finally, as regards the overall socio-environmental management system for the project, they found that, while there was adequate capacity in principle to lead it toward the achievement of its objectives, in relation to the "management of instances of social coordination and participation, weaknesses were observed with respect to articulation with other stakeholders, especially at the level of the central government, which have led to non-compliance with the requirements of the loan contract."[220]

The audit report concludes, finally, that project implementation had improved over the period under review and as compared with the situation encountered at the time of the auditors' first visit to the project's area of influence in August 2010, and that it had an especially "positive image" in terms of the indigenous and cultural heritage programs, which were "programs highly accepted by the population and with good impact and participation." However, it also provided a number of specific recommendations to strengthen ongoing implementation of each of the project's components and subcomponents. With respect to the biodiversity subcomponent, for example, these included "to seek ways of improving the sustainability of the project considering that there exist fears on the part of the staff of the protected areas with respect to the pressure that the [road improvement] project is generating on these areas and there is insufficient capacity to control all of the affected areas which are quite extensive."[221] It is also a matter of concern that, despite the fact that the environmental and social protection project (BO-0033) is well advanced and the road improvement project (BO-0036) is now completed, the auditors were unable to

[220] Ibid., pp. 36-37.
[221] Ibid. pg. 38. See pp. 37-39 for the auditors' other specific "recommendations/opportunities for improvement" as of September 2011.

report on progress with respect to the proposed "global regional development subprogram" of the Institutional Strengthening and Sustainable Municipal Development program because "it did not apply for the present period audited," without any explanation as to why this was the case.[222]

In summary, implementation of the two Bank projects for the Santa Cruz-Puerto Suárez road corridor has proven to be very problematic. As a reflection of this, the main conclusions drawn in the respective case study report[223] included the following: One of the principal defining – and strategic – features of the two interlinked projects for road improvement and environmental and social protection in the Santa Cruz-Puerto Suárez corridor was precisely that they were to be both legally and operationally interconnected in order to ensure satisfactory progress with respect to the latter prior to proceeding with the former. However, during implementation, because of the significant delays in the execution of the agreed environmental and social protection measures, the two projects were, *de facto*, delinked and Bank disbursements for the road improvement part of the program were allowed to go ahead in advance of adequate progress toward the previously prescribed requirements regarding the environmental and social management interventions to be taken in the road's area of influence. This single administrative action, which was not subject to Bank Board or even Headquarters approval, effectively undermined the initial design of the two deliberately interconnected operations and, in the process, greatly reduced the Bank's leverage to ensure that the necessary environmental and social protection measures in the Santa Cruz-Puerto Suárez corridor would be taken in a timely way vis-à-vis the road improvement activities.

As a consequence, while the Bank-financed road improvement investments under project BO-0036 have now been completed, many of the associated environmental and social management activities intended to help avoid and/or mitigate the potential direct, and especially indirect, adverse impacts of the road improvements under project BO-0033 are still not adequately in place. Also, as a consequence, according to the April 2010 supervision mission, the projects were not in full compliance with the Bank's present environmental and social safeguard policies. Thus, among the most important conclusions and lessons from the implementation experience of these two road improvement-related projects in Bolivia are:

[222] Ibid., pp. 6 and 29.
[223] See John Redwood III, *Managing the Environmental and Social Impacts of a Major IDB-Financed Road Improvement Project in Bolivia*, op. cit.

i. As was also observed with respect to the experience of other Bank operations reviewed above, especially the Darién Sustainable Development Project, no matter how well designed a project may be from an environmental and socio-cultural management perspective, what matters most is how well the proposed environmental and social measures are implemented and what their actual results are. Among other things, this means that their implementation needs to be carefully monitored and supervised and their outcomes need to be thoroughly and honestly evaluated and needed follow-up measures identified and implemented (see also the next section).

ii. The Bank needs to ensure that its administrative actions during the course of project implementation do not undermine critical aspects of project design, including, as in the present case, operational interconnections and associated legal obligations that were intended to assure adequate protection and mitigation of potential adverse socio-cultural and environmental impacts of major road investments financed by different sources along a single corridor in their collective area of influence. This is important not only to help guarantee that projects are able to successfully achieve their broader sustainable development objectives, but also to ensure that Bank environmental and safeguard policies are properly applied and, in the process, to avoid – or at least minimize – the potential reputational risks for the Bank associated with non- or inadequate compliance with its policies.

iii. Not taking the above precaution is also important so as not to effectively "devalue" the prior strategic environmental and social assessment work undertaken -- including in this case with non-reimbursable grant financing from the Bank itself through a large Technical Cooperation operation -- as an important part of program preparation and critical input into project design, and, as of July 2006, also an unambiguous Bank environmental and social safeguard requirement. In short, through a single administrative act, the Bank "overrode" the content and results of much of its own earlier project preparation and appraisal work in a way inconsistent with both the spirit and the letter of its own current safeguard (and perhaps other) policies.

iv. The Bank's recent environmental supervision missions and the independent environmental and social audit of project interventions have identified serious concerns with the sustainability of certain BO-0033 project interventions, including with respect to the strengthening and management of the three protected areas in the road's area of influence. However, there is no indication as to how – or even whether – the required measures to assure the sustainability of these actions would be funded or implemented beyond the life of the project. The Bank should, therefore, carefully identify and implement needed follow-on measures in order to ensure the sustainability of desired project economic, social and environmental outcomes.

v. More specifically, the area of influence of the road investments in Bolivia are characterized both by rich natural resources, unique biodiversity and sensitive ecosystems, on the one hand, and high levels of rural poverty and socio-cultural diversity, on the other, while at the same time being a region of weak local institutions and governance. This means that both the short and longer term challenges of promoting and achieving sustainable development are especially daunting. While the road improvements supported by the Bank and other donors, thus, represent a significant opportunity to promote economic and social development in the Santa Cruz-Puerto Suárez corridor, in and of themselves and even assuming that the interventions contained in BO-0033 are successfully implemented over time, they will not be sufficient for this future development to occur in an environmentally and socially responsible and equitable way over the longer run. As has occurred in the Amazonian state of Acre in Brazil, which has faced similar challenges, the Bank should, therefore, proactively seek to continue to provide environmentally and socially sustainability-oriented development assistance, including for improved local governance, accountability, and institutional capacity building, to -- and within -- the project's direct and indirect area of influence.

G. Bank Supervision, Monitoring , Reporting, and Evaluation

This exercise did not undertake a detailed review of Bank supervision, monitoring, reporting and ex-post evaluation experience across the projects reviewed on a case-by-case basis.

Based on the specific case studies, however, it is possible to briefly draw some general conclusions and lessons in this regard, especially as reflected in the Bank's experience with the completed Porto Velho-Rio Branco Road and Darién Sustainable Development Projects and the partially completed Santa Cruz-Puerto Suárez Corridor Program, where the following lessons can be extracted from the respective case study reports:

i. Proactive Bank supervision is as important as its role in project preparation, up-front environmental and social assessment, design, and appraisal. In the case of the Porto-Velho-Rio Branco Road Project, for example, as the PCR concluded, the Bank's close accompaniment of project execution was decisive to accelerate it and authorize alterations in the Definitive Action Plan (PAD) in accordance with the needs and priorities of the beneficiaries. By being sensitive to local demands, the Bank became an important interlocutor for the beneficiaries, at times taking on the role of mediator between the federal government and local governmental and non-governmental institutions. The Bank's determination that the project should not proceed without substantial modifications in its management and priorities, suspending disbursements for nearly a year, was decisive in the Brazilian Government's eventual willingness to make the needed changes to PMACI.

ii. Systematic supervision, monitoring, reporting, and evaluation of projects, especially challenging and complex ones like the Darién Sustainable Development operation, are essential for an adequate understanding of what actually happened – and what did not – in relation to what was intended and attempted, as well as with respect to the results and impacts of these interventions, both positive and negative and expected and unanticipated. More importantly, they are necessary in order to help replicate good practice and successful outcomes and to avoid the same pitfalls and/or making the same mistakes in future Bank-supported projects having similar objectives and/or taking place in similar circumstances and/or contexts. These valuable lessons of experience also

need to be carefully and systematically incorporated into the design of relevant future projects.

iii. Careful environmental and social monitoring and Borrower and Bank supervision of major road improvement – and other large infrastructure – projects is also essential to ensure that unanticipated impacts are properly identified and addressed during the course of project implementation. In the case of the Santa Cruz-Puerto Suárez projects, this was one of the reasons why an independent environmental and social auditor was to be contracted prior to the initiation of road construction works. The failure of the Borrower to do so and of the Bank to insist that this be done prior to the start of new road construction and the disbursement of loan proceeds for this purpose, represents one of the main shortcomings of their management of these interconnected operations. In addition, when different Bank sector units and both field-based and Headquarters staff are involved in this process, as in the present case, supervision activities also need to be well coordinated.

More specifically, with respect to the two latter operations, an internal organizational factor, increasingly complicated Bank supervision of the Santa Cruz-Puerto Suaréz road improvement and environmental and social protection projects. This is the fact that three distinct Bank units, for transport (STD), agriculture and natural resources (RND), and environment and safeguards (ESG), respectively, have been involved in project supervision activities in recent years, often with insufficient coordination among them. An internal division of labor in the supervision of BO-0036 and BO-0033 existed even before the Bank's realignment in 2008, but became even more complex subsequently.[224] In addition to the operational units for transport and for agriculture and natural resources, which includes rural land tenure and management-related aspects, ESG has needed to become directly involved in project supervision after the realignment

[224] Prior to the realignment, BO-0036 was supervised by the Infrastructure Division and BO-0033 was supervised by the Environment and Natural Resource Division of Region 1, which was responsible for Bank operations in the southern cone countries, including Bolivia. With the realignment the three former regional management units, into which the Bank had previously been organized, disappeared and were replaced by two new Vice Presidencies for Countries and Sectors, respectively. The latter Vice Presidency now contains the operational divisions for Transport (STD) and Agriculture and Natural Resources (RND), while a separate Environmental and Safeguards Group (ESG) was created in parallel, all three under the new Vice Presidency for Sectors.

because BO-0033 essentially involves the implementation of environmental and social mitigation measures prescribed by the (scaled-down) SEA, and, thus, also entailed important reputational risk considerations for the Bank in relation to application of its environmental and social safeguard policies. There is presently still a need for better coordination across at least two of these three units, RND and ESG, since BO-0036 was closed as of June 2011.

More generally, close Bank supervision of complex projects such as those considered above, especially in sensitive and dynamic frontier region environments, is particularly important. So is comprehensive and systematic reporting of how these projects evolve over time, particularly with respect to unanticipated events and impacts, as the Porto Velho-Rio Branco, Darién, Acre and Santa Cruz-Puerto Suárez projects clearly demonstrate.[225] Discussions with task team members for the Pasto-Mocoa Project likewise revealed that several important changes that occurred during the course of project preparation and design have not been adequately documented and the same clearly appears to have been the case with regard to the Santa Cruz-Puerto Suárez operations, especially in terms of what happened in the process of narrowing down the measures incorporated in the Environmental and Social Protection Project, eventually approved by the Bank, from the much larger set of actions proposed by the Bank-financed SEA. In short, while this was explicitly mentioned in the corresponding Loan Proposal, the actual decision process involved and the reasons for accepting or not specific recommendations contained in the SEA and the associated Environmental and Social Management Report (ESMR) are never clarified in the project documents.

Bank supervision should also closely monitor and seek to ensure full compliance with all project legal agreements, and, where instances of non-compliance are found, as occurred in the case of the PMACI component of the Porto Velho-Rio Branco Road Project, propose the appropriate remedial actions to Bank management, which, in turn, should apply them. This is especially important in the case of environmental and social management requirements associated with the application of its safeguard policies, because of the potentially serious reputational risks for the Bank in cases of non-compliance. It also means that Bank project documents and associated legal agreements need to be very specific as to what is required in this

[225] In these cases, Bank project documents only appear to part of the story and it was necessary to turn to other sources, such as the PMACI seminar report in the case of the former, and discussions with Bank staff familiar with the operations in order to have a more complete account of relevant events and outcomes.

regard, unlike some of those reviewed in the context of the present review, as in the case of the Bank's Guarantee for the IIRSA Norte road project, for example.

It is likewise essential that the Bank's Completion Reports (PCRs) and associated independent ex-post evaluation exercises -- which should, indeed, be undertaken for all major road and other infrastructure projects in frontier regions, such as the multi-country Amazon Basin and the other areas affected by the projects covered in this review -- give adequate attention to project environmental and social environmental aspects and impacts and how they were managed. As seems to have occurred in connection with the Acre Sustainable Development Project, it is likewise essential that any such evaluation reports, which are agreed to be produced as part of such independent evaluations, in fact, be delivered – and that the Bank ensure that this is the case before finalizing the associated payments to the consultants involved – and properly recorded in the Bank's physical and electronic document systems.[226] All of this institutional memory is important in order to faithfully record – and learn from – the positive and negative features of project implementation and outcomes.

Finally, as already observed above, PCRs and other Bank post-completion evaluation exercises should routinely include an *ex-post* economic analysis of all projects. In the case of road improvement projects, where a cost-benefit analysis is used, the same analysis should be undertaken after project completion using actual (as opposed to estimated) project cost and implementation time data. In addition, both *ex-ante* and *ex-post*, the Bank should seek to quantify and "monetize" the project's indirect economic, environmental, and social benefits, especially those expected to occur within its direct and indirect areas of influence, and the associated costs, but, at a minimum, it should clearly identify these costs and benefits in qualitative and approximate (i.e., rough order of magnitude) quantitative terms and assure that they are properly aligned and consistent.

[226] In this case, an ex-post assessment of the project's environmental and social management aspects was included in the Terms of Reference for the independent consultants, but the corresponding report could not be found either in the Bank's document files, by the resident mission in Brasília, or by the consulting firm that was to carry out this and other parts of the independent evaluation itself. A change in field-based Bank task team leaders for the project while this evaluation process was taking place apparently increased the uncertainty as to what actually happened in the regard.

H. Conclusion

Based on the experience with the IDB-financed operations summarized in the preceding sections, many lessons have been – and can be – learned by the Bank with regard to the proper management of environmental and social impacts associated with major road construction and pavement projects in ecologically and socio-culturally diverse and sensitive natural resource rich frontier regions. Some of the most important of these, in conclusion, can be reiterated and further elaborated with reference to the case study projects, as follows:

1. Especially in frontier regions, the indirect environmental and social effects of major road improvements may frequently be much greater and more widespread than their direct ones. This is the case because one of the main purposes of such investments is to improve access and reduce transportation costs to and from formerly remote areas, thereby opening them up for new settlement and/or the increased exploitation of their natural resources, both renewable, such as forests and soils, and non-renewable, such as minerals and hydrocarbons. In short, their purpose is precisely to induce further development. But doing so can – and often does -- result in considerable land use conversion and/or environmental modification, including significant deforestation and forest burning with associated adverse impacts on vital ecosystem services, natural habitats, biodiversity – and possibly even local climate – being among the most significant, and whose destruction or loss may prove irreversible. If indigenous peoples and/or other "traditional" and potentially vulnerable populations -- such as rubber tappers and small subsistence farmers and riverine communities in the case of Acre in Brazil or the smallholders located along the Pan American Highway corridor in Darien, Panama and the proposed new alternate San Francisco-Mocoa road in southern Colombia -- are located in these formerly remote areas, improved access can also imperil them as the result of the likely increased contact – and potential conflicts -- with loggers, miners, farmers, ranchers and others that may be induced to come into the region. This includes the possible invasion/encroachment of indigenous lands, whether demarcated or not, and legal reserves, as seems now to be occurring in the immediate vicinity of the Interoceanica (or IIRSA Sur) road corridor in Madre de Dios in the Peruvian Amazon. Thus, it is necessary to properly identify the entire (i.e., both direct and indirect) area of influence of any major new road investment and to consider the economic, social, and

environmental impacts it may have within this area and on its resident – and potential immigrant – populations.

2. Given that one of the main purposes of rural road improvements in frontier areas is to induce further local development, which may have significant environmental and social, as well as economic, impacts, it is also necessary to consider the potential effects of these investments together with those of closely associated development interventions – i.e., to consider their cumulative impacts. As in the earlier case of Rondônia, at the time the Porto Velho-Rio Branco Road Improvement Project was appraised by the IDB, it was considered likely that one of the associated outcomes of this initiative would be new agricultural settlement, either as the result of new official colonization projects or as a consequence of increased spontaneous migration to the project's area of influence, or both, which could have additional significant adverse environmental and social impacts. Even though, in this particular case, such an inflow did not ultimately occur, it is noteworthy that, even in the mid-1980s, the Bank clearly identified this potential risk and sought to build measures into the project to control or mitigate it through PMACI, including the strengthening of ecological protected areas and indigenous peoples' reserves. The Acre Sustainable Development Project, in turn, incorporated in its basic design a series of interventions related to land tenure and sustainable use and the establishment of additional protected areas in the zone adjacent to the new BR-364 highway segment to be paved, prior to the initiation of any new construction work. Both are, thus, examples of good practice. In contrast, the design of the Darien Sustainable Development Project underestimated the impact of upgrading a section of the Pan American Highway on adjacent land values and prices and the effects this would have both in relation to land use and the spatial and social dislocation of some of the very low-income population the project was designed to benefit, among other perverse effects, including on local protected areas and biodiversity.
3. For these reasons, before undertaking a major road improvement in such areas, it is first important to identify and understand, as fully as possible, both their existing ecological and socio-cultural conditions and current population and productive occupation trends and to project, as adequately as possible -- with establishment of an ongoing monitoring program to determine how the situation actually evolves in this regard -- what is likely to

happen in demographic, economic, social and environmental terms once access is improved and transportation costs significantly reduced. This also means the need to understand – and monitor -- the local political economy and governance conditions in frontier areas to the extent possible and how they are likely to evolve in response to any proposed major transport improvements, especially as these areas tend to have very different governance characteristics and trajectories than older and more settled regions given the frequent predominance of illegal, as well as uncontrolled, productive activities and, more generally, their "wild west" nature, with their associated particular social and institutional characteristics. Strategic Environmental Assessments (SEAs) have been used by the Bank in a number of recent cases, as, for instance, in the preparation of both the Santa Cruz-Puerto Suarez and Pasto-Mocoa projects, which took the form of a Regional Environment Assessment (REA) in the latter, and similarly broad environmental impact assessment (EIA) exercises appear to have been carried out in advance of the Darien and Acre Sustainable Development and IIRSA Norte operations as well, in order to capture many of these features of the project areas of influence in question, for which the Bank is to be commended, although greater attention could – and should -- have been given to the local political economy and governance conditions in most cases.

4. Taking a sustainable development approach to the direct and indirect area of influence of a major rural road improvement project in a natural resource rich frontier region, especially in areas subject to the risk of significant deforestation, ecosystem destruction, and loss of biodiversity, will necessarily involve controlling future land use in this area, among other precautions, particularly in zones in relatively close proximity to the trunk road itself and/or to any secondary roads that branch off from it, as was specifically recognized in the IIRSA Norte case. The Darien and Acre Sustainable Development, as well as the Santa Cruz-Puerto Suarez and Pasto- Mocoa Projects clearly anticipated this, although the first and third seem to have failed, while the second appears to have succeeded and it is too soon to tell what will happen in the case of IIRSA Norte.–
5. This, in turn, will require both increased knowledge of and control over the land tenure situation and an ability to closely monitor and limit any forest conversion to other uses that does take place, through environmental licensing, remote sensing, ground truthing, and other means. These are among the key elements that were built into the design and

subsequent implementation of the Acre Sustainable Development Project along the segment of the BR-364 that was to be paved as part of this operation. Moreover, as the respective PCR correctly points out, as do Bank appraisal documents for most of the other projects reviewed, both the timing and the sequencing of these interventions is very important, with the need for the land use controls to be fully in place prior to the actual road improvement. In fact, these measures should be carried out well in advance of any such intervention to head off to the extent possible the land speculation that is likely to occur in anticipation of the nearly certain substantial increase in land values that will take place once access is improved and transport costs are lowered as a result of these investments. The Darien Project even attempted to incorporate an "Environmental and Social Sequencing Matrix" to help assure that this desired result would occur, while the Santa Cruz-Puerto Suarez Corridor program contained two operationally and legally interconnected Bank loans with the same intention. However, unfortunately, both of these attempts to properly sequence environmental and social protection/management and road improvement operations have broken down in practice.

6. Creating and/or strengthening official protected areas -- including indigenous peoples' reserves, where applicable – are also an important part of this process. More generally, as the earlier Porto Velho-Rio Branco project contemplated, undertaking a participatory agro-ecological (or economic-ecological) zoning exercise of the road's direct and indirect area of influence is likewise a precondition in order to determine which parts of the affected region are appropriate for what kinds of productive use and/or merit stronger protection and conservation, and, thus, should effectively be declared "off limits" for new settlement and land conversion.[227] An exercise of this sort was, in fact, carried out in Acre in 2001, which clearly identified the State's sustainable forestry vocation, together

[227] For one general discussion in this regard with respect to the Brazilian Amazon developed jointly by the World Bank and IMAZON, an important environmental non-governmental organization in the region, see Robert R. Schneider, Eugênio Arima, Adalberto Veríssimo, Paulo Barretto and Carlos Souza, *Sustainable Amazonia: Limitations and Opportunities for Rural Development*, World Bank Technical Paper No. 515, Washington D.C., 2002. A Portuguese version of the same document was previously published as *Amazônia Sustentável: Limitantes e Oportunidades para o Desenvolvimento Rural*, World Bank/IMAZON, Brasília, 2000. On the identification of environmental and indigenous protected areas in the Amazon region more generally see, Adalberto Veríssimo, Adriana Moreira, Donald Sawyer, Iza dos Santos, and Luis Paulo Pinto (organizers) and João Paulo Ribeiro Capobianco (general coordinator), *Biodiversidade na Amazônia*: *Avalicação e Ações Prioritárias para a Conservação, Uso Sustentável e Repartição de Benefícios*, Instituto Socioambiental, São Paulo, 2001.

with the need for land tenure regularization "to guarantee security in rural areas and control the destiny of public lands," according to the final evaluation report for the Sustainable Development Project.[228] However, it is also important to recognize that such zoning exercises, in and of themselves, are not a panacea and that it is essential that they not be limited to a set of technical studies alone, important as they are, but also require the effective involvement and participation of all affected stakeholders, both in order to better educate them about local sustainable natural resource use potentials and constraints and to obtain to the extent possible their "ownership" of the proposed land use measures and restrictions that should be the final output of such initiatives. In short, land use zoning, especially in rural frontier areas, is ultimately both a technical and political process and needs to be viewed and conducted as such.[229]

7. In this connection, furthermore, major road upgrading projects in natural resource rich frontier regions should not only seek to "avoid harm" to the environment and to indigenous and other vulnerable local communities in their areas of influence, but also proactively seek to "do good" by containing measures to directly strengthen and enhance these ecosystems and benefit, as well as protect, populations. Thus, they should be designed and utilized to the extent possible as broader local development undertakings, not only in terms of improving access and reducing transport costs -- and, thus, indirectly stimulating new and/or enhanced local productive activities, important as these are, especially in remote regions -- but also seek to identify and promote socio-economic and other opportunities to enhance the income, employment and living conditions of resident populations, especially the poorest. As was specifically attempted, although with differing outcomes, in both the Darien and Acre Sustainable Development Projects, and to a lesser extent in some of the other projects reviewed, in other words, major road improvements in frontier areas and elsewhere, should be conceived and implemented as part of more holistic spatially-defined efforts to promote and help realize long-term environmentally and socially sustainable development objectives in these regions more generally.

[228] Tellus Consultoria, op. cit., pg. 6.
[229] See, for example, Dennis J. Mahar, *Agro-ecological Zoning in Rondônia, Brazil*, op. cit., and Dennis J. Mahar and Cecile L. H. Ducrot, *Land-Use Zoning on Tropical Frontiers: Emerging Lessons from the Brazilian Amazon,* EDI Case Studies, World Bank, Washington D.C., 1998.

8. This also clearly points to the need for any such interventions to be as participatory as possible. Again, the lessons drawn from the Porto Velho-Rio Branco Road improvement project after the suspension of disbursements and its associated externally political and locally demand-driven decentralization, as well as the approach proposed and followed in the Acre Sustainable Development Project and the other road improvement/environmental and social management operations surveyed in Panama, Bolivia, Peru, and Colombia, were the appropriate ones in this regard. The importance of involving local stakeholders, both from the perspective of making maximum use of local -- including indigenous -- knowledge and in order to incorporate their concerns and inputs into project design and implementation in such regions and elsewhere, cannot be sufficiently emphasized. While stakeholder interests may frequently be conflicting, especially in natural resource frontier areas, as the Bank seminar held to discuss the PMACI experience in December 1994 concluded, unless potential conflicts are explicitly recognized and addressed, major investment projects – and agro-ecological zoning exercises -- in such regions may quickly or ultimately derail and, thus, fail to meet their environmental and social – and, thus, broader sustainable development – objectives, as had previously happened in Rondônia. Subsequent experience in the Santa Cruz-Puerto Suarez and Past-Mocoa corridors seem to verify the significance of this potential risk.
9. Finally, while the consistent and effective application of Bank environmental and social safeguards are important in such situations, strong, consistent and demonstrated local political will and support are even more essential for such initiatives to be successful. As the PCR for the Acre Sustainable Development operation, in particular, affirmed, this needs to be carefully assessed and assured up-front, and, in fact, should be a critical precondition for Bank agreement to finance major road improvement projects, especially in ecologically and/or culturally sensitive regions which require significant environmental and/or social management measures to be in place before proceeding with such investments. While the PCR for the Darién project did not give as much explicit attention to this factor, it did point out the need for national macroeconomic and sectoral policies that are consistent with and supportive of regional project objectives, It is likewise important, as suggested above, that the pertinent financing institutions both include such conditions in project legal agreements and carefully monitor and enforce

Borrower compliance, as occurred, albeit with considerable outside pressure, in the case of the Porto Velho-Rio Branco operation.

In summary, whether their primary objective is to stimulate local development or to strengthen interregional – and, in some cases, international -- territorial and economic integration, major interurban and rural road improvements, especially in natural resource rich frontier regions, are likely to have significant direct, indirect -- including induced development -- and cumulative environmental and social impacts, which need to be properly and clearly identified, anticipated, and adequately addressed. While each case will have distinct needs and requirements depending on the particular geographic, ecological, economic, socio-cultural, and political-institutional context involved, it is essential that these contexts be properly understood through a sufficiently comprehensive up-front environmental and social assessment and subsequent participatory environmental and social management and monitoring process. In this regard, project design and preparation will benefit from the effective use of Strategic Environmental Assessments (SEAs) that should also focus on a broader set of development initiatives in the same direct and indirect area of influence as that of the major road improvement in question. Such assessments should also contemplate potential project impacts that cross national borders, as appropriate, as, for example, in the case of the Santa Cruz-Puerto Suarez road corridor operation and perhaps also in relation to the Pasto-Mocoa project in the future.

In addition, a more holistic or comprehensive spatial – rather than sector by sector -- approach to sustainable development around the physical and economic corridor polarized by the road segment to be improved is recommended. Building on its successful experience to date in northwest Brazil, the IDB should not only approach road improvement projects in areas having similar characteristics elsewhere in Latin America in the same comprehensive, creative and proactive fashion, as it also attempted to do in Panama, but, as in Acre, it has an excellent opportunity to lead the way with regard to the promotion of environmental quality and socio-cultural protection objectives at the subnational level through the systematic and coordinated implementation of a broader set of sustainable development interventions together with such road investments. In doing so, however, it should avoid the two interlinked project approach taken in the case of the Santa Cruz-Puerto Suarez corridor, which ultimately broke down, and

strongly consider the multi-phase project approach recommended at the time the additional financing was approved for the Darien Sustainable Development Project in 2007.

Lastly, it is important not to forget that, while good up-front SEAs, corresponding environmental and social management plans and appropriate project preparation design are essential, at the end of the day, what matters most is what actually happens – or does not happen -- on the ground. Thus, project implementation and proper and well-coordinated Bank monitoring and supervision, with an eye toward adaptive management, including in response to unanticipated events and/or project impacts, is likewise very important. Good reporting, both during and after project preparation and implementation, is likewise important, as is detailed and systematic ex-post evaluation, in which environmental and social aspects and impacts should receive explicit attention together with other project components and outcomes, especially in large lending operations for road and/or other infrastructure improvements in complex and dynamic natural resource frontier settings such as those considered in the present review.