THE VALLEY OF THE TUCAVACA, BOLIVIA: IMPACTS OF THE SANTA CRUZ-PUERTO SUAREZ CORRIDOR

Written by Viviana Caro

Although the Bolivian economy has undergone major structural changes in the last two decades, the country has continued to follow a development path based on the extraction and export of commodities. This emphasis on exports has placed pressure on Bolivia's natural resources. The country has been experiencing severe economic and social problems in recent years. In this context, the Government of Bolivia (GoB) is continuing its strategy of export-led growth, namely exports of minerals, hydrocarbons, and agricultural products. The economy is showing signs of improvement, primarily as a result of rising international commodity prices. With this growth, demand is increasing for infrastructure investments to reduce transport costs and improve Bolivia's competitiveness in international markets.

One component of the GoB's export-led growth strategy is participation in IIRSA, the Initiative for the Integration of Regional Infrastructure in South America[1]. This study looks at the impact of the IIRSA component which will connect Santa Cruz to Puerto Suarez with a year-round road. The primary objective of this initiative – which is already underway – is to facilitate the export of soy products. The Santa Cruz-Puerto Suarez Corridor will cut through the Chiquitano Dry Forests of Bolivia, in the Valley of Tucavaca in the department of Santa Cruz. These forests have remained, until now, largely uninhabited and environmentally pristine. They form part of the Pantanal region, which is widely recognized for its biodiversity and critical role in water regulation. The region is inhabited by a variety of ethnic groups who rely on the forests for subsistence.

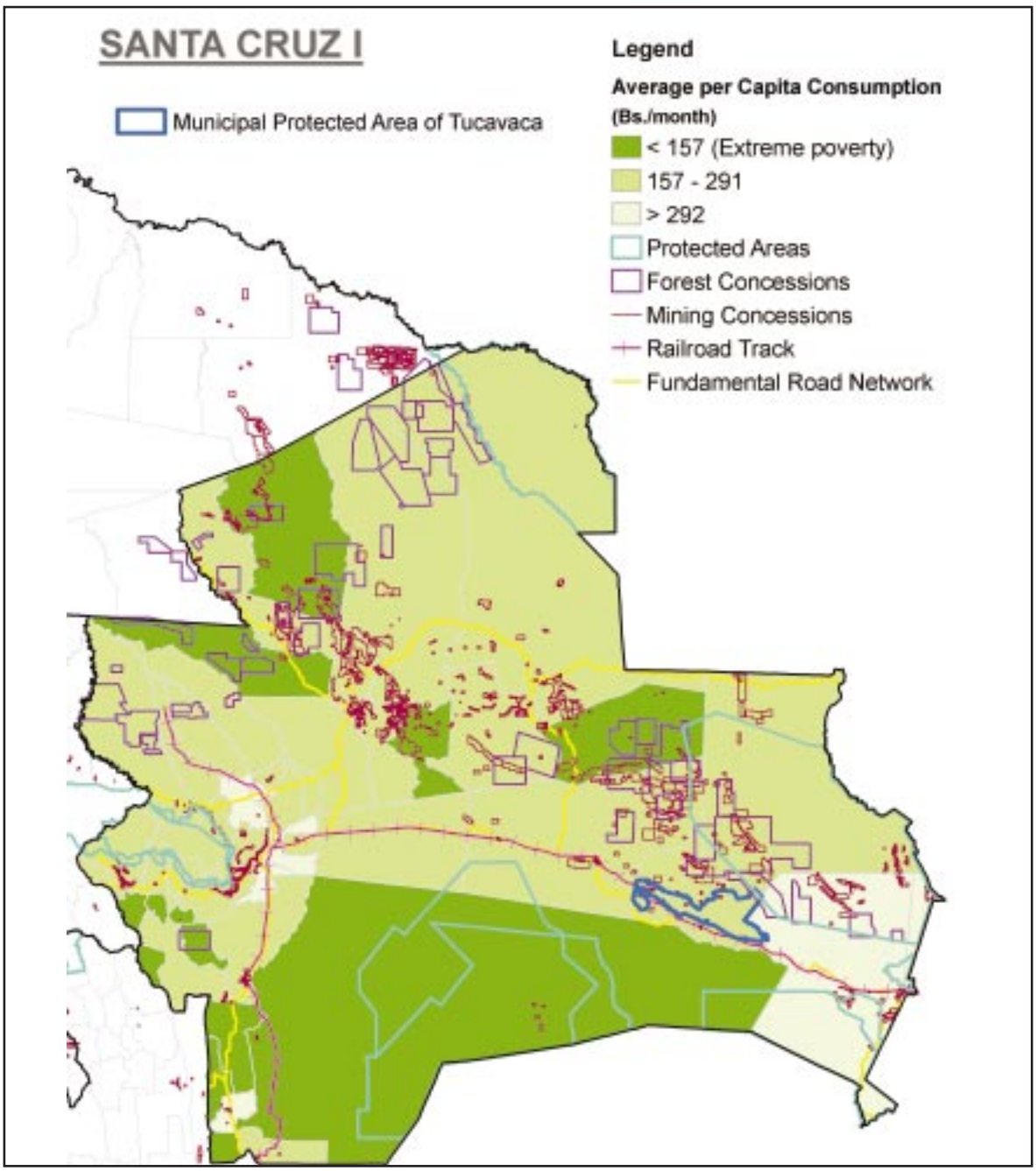
Because of the country's recent political and economic crises, and the impending Constitutional Assembly, GoB planning is limited to the short and medium term. The limited scope of planning is reflected in the country's formal relations with the international community. Bolivia has not been able to sign a PRGF with the IMF since 2001. The Poverty Reduction Strategy Paper (PRSP), which was initially planned to cover the period to 2015, has been limited to 2007. Within this limited timeframe, the government's strategy for improving growth and employment stresses improved access to international markets. The World Bank and the IADB support the government's approach to development in their respective strategy documents. The Santa Cruz-Puerto Suarez Corridor is being promoted in this short-term policy context that supports development of exports as a key to macroeconomic improvements

In order to assess the impacts of the Corridor using the Strategic Environmental Vulnerabilities Assessment approach, the study begins by reviewing the environmental and socioeconomic baseline, with a close look at the vulnerabilities of the Municipal Reserve of the Valley of Tucavaca. The next sections review experience to date with the expansion of soy production in the region and with the IADB-funded Environmental and Social Protection Program designed to mitigate the negative impacts of the implementation of the Corridor. The paper concludes with an estimate of some likely impacts and several recommendations to reduce the impacts.

Environmental Baseline

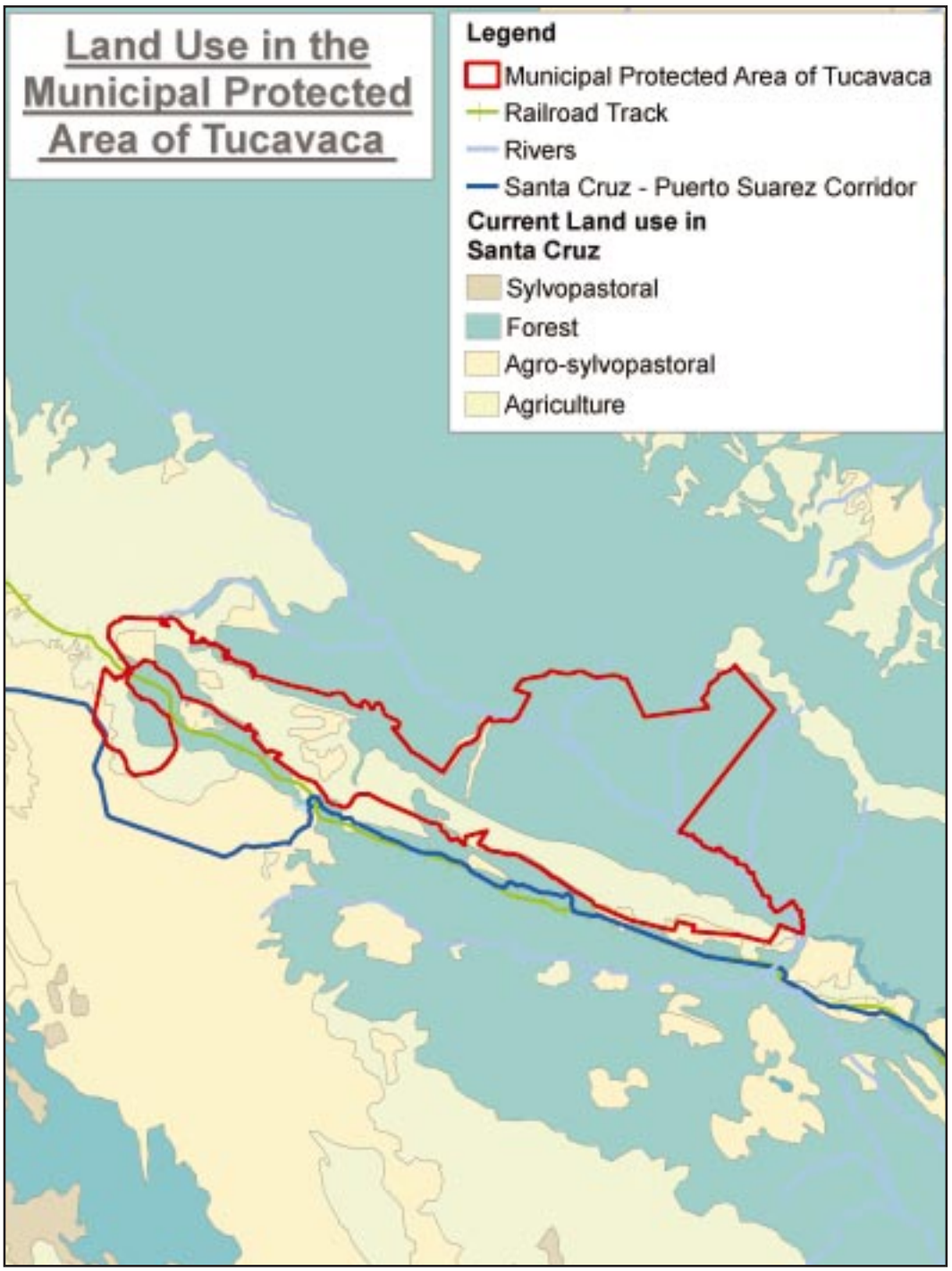
Bolivia has an abundance of renewable natural resources. Forests still cover 48% of the country, and many ecosystems are largely intact. The country is considered one of the richest in biodiversity: It ranks seventh in bird diversity, 10th in vertebrates, and 15th in primates, with high indices of endemism. Among Bolivia's critical ecosystems is the Pantanal, a mosaic of lakes, swamps, and rivers in the Upper Basin of the Paraguay River. This ecosystem, which extends into Bolivia, Brazil, and Paraguay, is one of the largest tropical wetlands and one of the richest ecosystems in the world. Given its central location in South America, it is home to the fauna and flora typical of Amazonia, the Chiquitano forest, Chaco and Cerrado regions. This

1 IIRSA is a multi-sectoral initiative involving 12 South American countries that seeks to establish mechanisms for coordination–among governments, multilateral financial institutions and the private sector–for investment plans and programs, integration and development hubs, and the development of a strategic vision for South America. It was constituted in 2002. See **http://www.iirsa.org**



wetland provides critical environmental services. It regulates floods and droughts in the Paraguay River Basin; and it retains and distributes sediments and nutrients needed to maintain the ecosystem's productivity and high concentration of biodiversity. The Chiquitano Dry Forest, a unique type of tropical forest considered of great biological value, is located in the Chiquitano region of Bolivia's Pantanal.

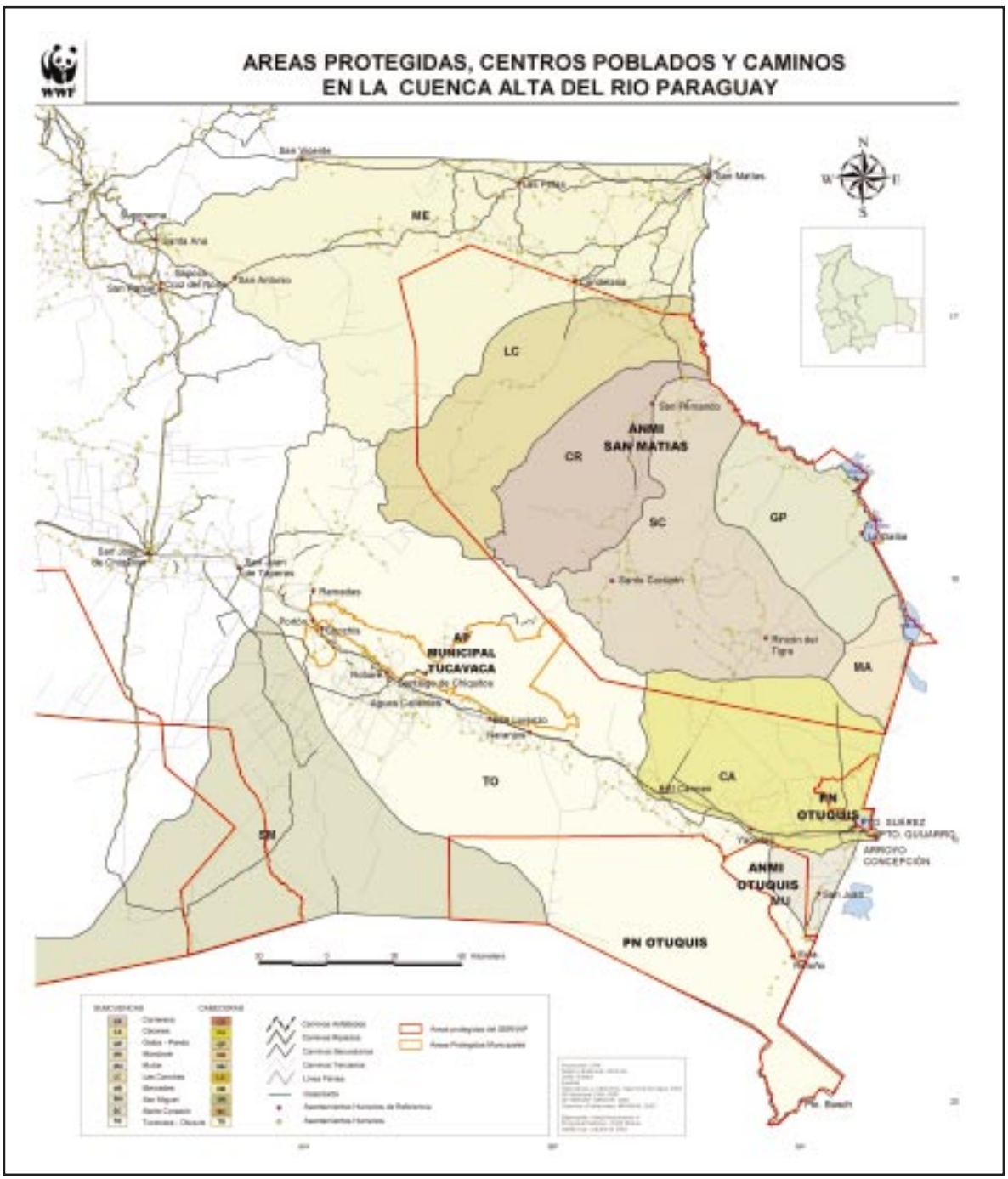
The main causes of ecosystem loss and degradation in Bolivia are changes in land use, namely intensification of forest exploitation and shifts from forestry to agriculture; human settlements in fragile environments; slash-and-burn practices; and over-grazing. These practices, as well as illegal hunting and trade, and unorganized tourism, are putting many species at risk. For example, some 254 plant species are listed by the IUCN as at risk, about half of which are categorized as Endangered or Vulnerable. For many species, there is insufficient data to determine vulnerability. Protected areas are also threatened by large-scale gold and silver mining, exploration for hydrocarbons, exploitation of geothermic energy, road construction, uncontrolled tourism, and drug trafficking.



Socioeconomic Baseline

Bolivia is one of the poorest countries in South America. Its pattern of growth – based on export of minerals, rubber, oil and soy products – has generated exclusion and inequality. Over the last two decades, the country has moved from being primarily rural to primarily urban, and indicators on health, education, and basic sanitation have improved significantly. However, indicators on income, employment and productivity have stagnated.

Bolivian poverty rates are high. As of 2002, 64.6% of the population was below the poverty line and 37% was indigent. Poverty is worse in rural areas where it reaches 80%. Economic growth rates, which averaged 3.1% annually from 1986 to 2002, were clearly insufficient to reduce poverty. Income inequality is also striking. As of 2002, the mean income of the 10% of the population with the highest income was 35 times that of the poorest 10%. Inequalities exist not only in income distribution but also in access to resources, channels for social and political participation, and exclusion of



impoverished and indigenous populations. These inequalities are captured, at least in part, by the UNDP's Human Development Index (HDI), which was recently constructed at the municipal level in Bolivia. Rural municipalities have lower HDI scores than urban municipalities.

Current land and natural-resource use and tenancy in the Pantanal region are the result of a historical process that began with the original indigenous settlers. The lack of roads has kept the region fairly pristine. Population density remains low (1 per km^2), and 70% of the population lives in urban areas. The primary activities of the in the region are agriculture, cattle ranching, and fishing. Change in the Pantanal region today is driven by the development of roads (Santa Cruz-Corumbá Corridor; San Ignacio-San Matías Road) and of gas transportation infrastructure. Productive activities expected to flourish in coming years are forest exploitation, cattle ranching, and production of soybeans.

Institutional Issues

Over the last 20 years, Bolivia has enacted a comprehensive set of environmental management regulations. However, the normative and institutional framework that was approved far exceeds existing human or financial capacity, both at the national and local levels. The current crisis has placed further constraints on public expenditures. Investment in environmental management is minimal (about 0.43% of GDP[2]), and most of these limited funds come from development aid. Implementation of environmental measures is complicated by a lack of environmental awareness and of technical capacity. It is also complicated by a general disregard for the national law in rural areas of Bolivia, where government institutions have only limited acceptance and local codes of conduct are often given greater weight. Moreover, in many cases, enforcement of environmental regulations would require restricting or prohibiting the production practices of the poorest segments of the population. The importance given to environmental issues – and to finding a link between sustainability and poverty alleviation – by the international financial institutions and development agencies is therefore critical to determining what is achieved in Bolivia.

Bolivia is known worldwide for the process of decentralization that was implemented in the 1990s as part of the structural reforms. While management of natural resources was not explicitly considered under the decentralization laws, municipalities and prefectures have been given greater responsibilities for natural resource management through various regulations as well as a greater share in the revenues generated for this purpose. Major steps toward decentralization have promoted the participation of local administrative levels in decisions about resource management. Given the limitations of the central government institutions responsible for the environment, and the diversity of the Bolivian population, decentralization could be critical for securing and maintaining environmental management in the context of the export corridor.

The Municipal Reserve of the Valley of Tucavaca

The Santa Cruz-Puerto Suarez Corridor will cut across the department of Santa Cruz, including the dry forest of the Chiquitano region. The Municipal Reserve of the Valley of the Tucavaca (MRVT) lies alongside the Corridor, clearly within its area of direct impact. This protected area, created in 2001, contains one of the best examples of protected dry forests and is critical for regional water regulation. The MRTV covers about 262,305 ha, representing about 37% of the Municipality of Roboré[3]. Until recently this area has remained fairly pristine and population densities are low. Today, the MRVT faces several threats: Hunting pressure is high. Extraction of timber, especially of high value species, is degrading the forests and threatens the fauna. Four mining concessions lie within the boundaries of the MRVT. And the existing agricultural system, based largely on slash-and-burn (*chaqueo*), poses a threat as pressure for land grows.

The Municipality of Roboré has a population of 15,200 according to the 2001 census, and the population is fairly stable. Population density is 2 persons/km^2. The poverty index is 53.4%, down from 60% in 1992. Unemployment is high. Of the working-age population, 45% are employed, and almost half of these are self-employed. Only 33% are involved in agricultural activities. Annual per capita income is approximately US$400. About 20 communities, a total of 4,043 inhabitants, are in close proximity to the MRVT. In addition, the town of Roboré has about 6,000 inhabitants, and nearby cattle ranches have about 500, for a total of about 10,000 people in the immediate MRVT region.

The rural communities face a number of challenges. Pressure for land is increasing, aggravated by tenure issues. The land regularization process has barely started; however, the cattle-raisers' association is promoting an internal regularization process for ranching properties. Public infrastructure in the region is very limited.

Of the rural socioeconomic systems identified in the region, which include colonists, ranchers and traditional communities, two have been identified as particularly vulnerable: Ayoreo communities and Chiquitano communities. These communities are considered vulnerable not only because of their poverty but also because of their dependence on, and limited access to, land and natural-resource base of the MRVT. The Ayoreo communities are itinerant indigenous groups, primarily Tobité and Urucú, whose livelihoods are based on hunting and gathering. The Chiquitano communities, which comprise most of the rural population in the MRVT area, live primarily from subsistence shifting agriculture. Of the 16 Chiquitano communities, 2 are peasant communities and 14 are indigenous communities. Both Ayoreo and Chiquitano communities are poorly represented in the municipal government.

2 This figure does not include expenditures for drinking water and sanitation.

3 The south-west boundary of the protected area has not yet been officially established.

Recent Experience with Development in the Region

A brief of review of recent experience in the department of Santa Cruz indicates the role that agricultural expansion and infrastructure play in environmental degradation, and the feasibility of implementing sustainable development programs.

Soy Exports and the Corridor

The Santa Cruz-Puerto Suarez infrastructure corridor will facilitate a variety of exports, but among the most important will be soy. Production of soybeans contributes substantially to the Bolivian economy. Soy was promoted in the eastern part of Santa Cruz beginning in the 1980s. Bolivia's agro-industrial oil complex, developed in the 1980s, now contributes 6% of GDP and 25% of exports. It generates 45,000 jobs directly. During the 1990s, preferential access obtained to Andean markets and the development of an agro-industrial oil cluster in Santa Cruz led to increased investments in soy production and the expansion of the agricultural frontier. The area under soybean cultivation grew from 40,000 ha in 1984 to 700,000 ha in 2003; it now accounts for one-third of total area cultivated in Bolivia. The expansion of the agricultural frontier has contributed substantially to increasing deforestation in the region.

Soybean production in Bolivia is competitive in terms of production costs, but transport costs are almost twice those of its neighbors. In order to reduce its high transport costs, the GoB has given priority to the bi-oceanic corridors supported under IIRSA. Construction of the Santa Cruz-Puerto Suarez Corridor, which is part of IIRSA's Central Interoceanic Hub, would considerably reduce transport costs to either ocean and within the region. Although there is already a railway and a road between the cities of Santa Cruz and Puerto Suarez, a distance of 600 km, the road is often not passable. The Corridor will include not only road transport but also fiber optic cable along the corridor, opening of the border crossing at Puerto Suarez-Corumba, Brazil, and access to the port. The soybean industry, among others, has been pushing for construction of the Corridor.

Experience with Corridor Implementation and the Mitigation Plan

The SEA commissioned by the IADB for the Corridor project cautioned that significant short- and long-term changes to the physical and social landscape of southern Bolivia would undoubtedly result from the corridor, including:

- significant deforestation due to the expansion of large-scale agriculture and extractive industries;
- increased pressure on indigenous communities and their territories due to an influx of settlers.

The SEA stated that over US$ 85 million in environmental protection and social compensation programs would be needed to adequately mitigate these impacts. It was estimated that, without the implementation of the proposed Action Plan, 5 million has of forest would be lost along the corridor, including 400,000 for agriculture and the remainder for cattle ranching. Even with implementation of the Action Plan, the SEA estimated that 1.5 million has of forest would be lost; however, fragmentation of the Chiqitano Forest would be avoided and the protected areas would not be affected. The program's components include land regularization and titling; sustainable productive development; and environmental management.

The GoB has already advanced in the construction of some sections of the corridor using CAF, IDB, and EU funding and international bids. As implementation of the Corridor began, the amount allocated to mitigation was reduced to less than US$ 30 million because of political and financial factors. This reduction clearly entailed major reductions in the program. Current funding is insufficient to address land regularization and titling in the region. Certainly more than 1.5 million has of forest loss can be anticipated. Implementation of the mitigation measures has also been hampered by a lack of capacity on the part of both public and private entities charged with carrying out the activities, as well as a lack of political will.

When two years after project approval, the GoB had not begun implementation, responsibility for implementation was transferred to the prefecture of Santa Cruz in 2004. However, this regional government is also institutionally weak and its activities are politicized. Its decisions on allocation of the funds will determine the outcome. Moreover, because of various delays and lack of coordination among donors, the segments of the corridor financed by CAF and the EU have been initiated without the protection that would be afforded by the social and environmental project. Negative social and environmental impacts, including increased colonization and land conflicts, are already occurring in these areas where construction has begun.

Since the MRVT is located in the area of direct impact of the Santa Cruz-Puerto Suarez corridor, the region will be immediately affected by the Environmental and Social Protection Program for the corridor. Among the mitigatory measures that should affect the MRVT-Roboré area are provisions for compensation to communities for property losses, changes in their access to water sources, fencing and others. There is also a great emphasis on land regularization as a tool to prevent property concentration and speculation, and to protect indigenous communities, colonists, and migrants from the invasion of land speculators. Land

regularization together with land-use zoning, especially for forestry purposes, at the local level are considered the primary tools for protecting the MRVT from massive deforestation and from the advance of the agricultural frontier.

Assessment of Potential Impacts

The environmental impact of the construction of the Santa Cruz-Puerto Suarez Corridor is considered here in the context of the macroeconomic and social conditions created by the national government's development policies. Both the impacts of the export-oriented macroeconomic policies and the specific impacts of the corridor and mitigation project in the MRVT region are considered. Recent experience points to some likely outcomes: In Santa Cruz, including the MRVT region, the growth of agricultural activities has taken place at the expense of primary and secondary forest cover, habitat and fauna. In addition to this direct impact, there have been indirect social and environmental costs. There is a clear correlation between the construction of roads, economic activity, and population flows in the department, created by movements of seasonal labor. In most cases, this temporary migration has led to permanent settlements, often on forest lands.

A continuation of existing trends in productive activities implies substantial land-use change in the MRVT region. Over the last decade, forests in Santa Cruz have been under heavy pressure from farmers and ranchers, both expanding their activities and looking for better soils. As international prices for both beef and agricultural products look promising, it is probable that the deforestation rate in the dry Chiquitano forests will increase. Notably, a recent study of the prospects of the soy agro-industrial complex considered two scenarios, one at annual growth rates of 7.5% and one at annual growth rates of 12% (Kreidler et al. 2004). Either figure implies significant expansion of the agricultural frontier.

The construction of the Corridor, within this framework of export-led development, does not fit easily with a strategy of sustainable development. Improved access to markets will promote higher rates of use and extraction of natural resources. The economic analysis of the Corridor justified its construction based on the expansion of agriculture, particularly soy, and cattle-ranching. Both of these activities have considerable negative environmental impacts, most notably forest clearing. Moreover, while the infrastructure development and new export opportunities are expected to support poverty alleviation for some inhabitants, they are also likely to increase inequality in the region. Some local populations will benefit from an increase in agricultural and non-agricultural income as a result of the construction of the corridor. However, the most vulnerable populations, namely the indigenous groups, will be least likely to benefit. In fact, by putting pressure on land and forest resources, expanding agricultural and export-oriented activities may worsen their living conditions. Increasing pressures on the land are already affecting the vulnerable populations who depend on continued access to the forest's natural resources.

Recommendations

The short timeframe of the national development policy – and likewise of the World Bank's Country Assistance Strategy and the IADB's **Bolivian Country Assistance Strategy** – needs to be taken into account when considering additions or improvements to its approach. To promote sustainability and environmental conservation through these strategies, it would be useful to incorporate technical assistance from development agencies for assessments of the environmental and social impacts of increasing regional economic integration. It would also be useful to incorporate technical assistance and support for improving the institutional framework for protection of biodiversity. As the IADB is the principal multilateral agency financing infrastructure projects in Bolivia, its role in the enforcement of environmental policies, including the findings of environmental impact assessments, should be strengthened. At a more local level, additional emphasis should be placed on spatial planning in local development plans, which can improve the sustainability of productive strategies and contribute to conservation in rural municipalities.

For environmental NGOs working in the country, there is a need to better understand the political and administrative structures that are emerging with decentralization, and the opportunities or problems these present for conservation of vulnerable ecosystems. Also, there is clearly a need to improve the monitoring and evaluation of infrastructure works and the mitigation programs that accompany them. Given Bolivia's strategic position in the IIRSA initiative, this aspect will be particularly important.

For the short term, specifically for the MRVT, an effort should be made to reinforce the forest vocation of the area through: 1) preparation of municipal land-use plans; and 2) promotion of land-use planning to protect areas rich in forest resources. The GoB has given some attention to the development of ethnic-based tourism. Given the limitations of forest extraction as a means to poverty alleviation for the vulnerable populations of the Tucavaca, this form of tourism is worth exploring. In combination with ecotourism, it could offer a valuable "export" with environmental and social benefits.

Selected References

Interamerican Development Bank. 2004.The Bank´s Country Strategy with Bolivia (2004-2007). Washington.

D. Robison, et al, eds. 2002. Plan de Manejo de la Reserva Municipal del Valle de Tucavaca. Fundación para la Conservación del Bosque Chiquitano, Municipio de Roboré y Fundación Amigos de la Naturaleza - Noel Kempff (FAN-Bolivia). Santa Cruz.

EEIA and Evaluación Ambiental Estratégica del Corredor Santa Cruz - Puerto Suárez. Informe Final. 2000. Consorcio Prime Engendharia, Museo Noel Kempff Mercado, Asociación Potlatch. Santa Cruz.

Government of Bolivia. 2003. XV Grupo Consultivo. Revisión de la Estrategia Boliviana de Reducción de la Pobreza 2004-2007. La Paz.

Kreidler, A., et al. 2004. La soya boliviana hacia el mercado libre en las Américas. USAID/Bolivia. Economic Opportunities Office. Bolivia.

Ministry of Sustainable Development. 2004. Informe Nacional sobre el Medio Ambiente 1996-2001. Final Draft. Proyecto de Fortalecimiento Institucional MDS-BID ATR/929/SF-BO. La Paz.

Pacheco, P. and D. Kaimowitz, eds. Nov. 1998. Municipios y gestión forestal en el trópico boliviano. Serie Bosques y Sociedad No.3. La Paz.

Ibisch, P.L. et al., eds. 2002. Conservation and Sustainable Development Plan for the Chiquitano Dry Forest, Cerrado and Bolivian Pantanal. Fundación para la Conservación del Bosque Chiquitano. Santa Cruz.

UNDP- Bolivia. 2004. Human Development Index of the Municipalities of Bolivia. UNDP, INE, UDAPE, Viceministry of Planning, Ministry of Sustainable Development. La Paz.

Urioste, M. and D. Pacheco, eds. 2001. Las tierras bajas de Bolivia a fines del siglo XX. Tenencia, uso y acceso a la tierra y los bosques. Programa de Investigación Estratégica en Bolivia. La Paz.

World Bank. 2004. Republic of Bolivia. Country Assistance Strategy. Washington.

WWF-Bolivia. Unpublished. Priorización de Cuencas para la Conservación en el Pantanal Boliviano.