ANALYSIS OF THE POTENTIAL FOR ECOTOURISM IN NORTHERN LITTORAL OF PARANÁ, BRAZIL: PROJECT SUMMARY

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INTRODUCTION

In the last decade, increasing international and national attention has focused on the protection and management of forest resources. Most people agree that sustainable development of forests, linked with efforts to generate benefits for people living in those forests, is instrumental in ensuring wise resource use and allocation. In order to encourage sustainable development, many new methods of resource use are being examined in addition to the traditional means of timber harvest or land clearing for agricultural purposes. Ecotourism has been promoted as one means to generate local employment and income in forest regions without the adverse effects attributed to timber extraction and agriculture. Despite the enthusiasm for ecotourism, however, substantial questions remain as to whether it can generate adequate local benefits and the number of locations that can capitalize on a perhaps limited ecotourism market demand.

In order to better assess the role of ecotourism in developing regions, we conducted an extended interdisciplinary project in the Atlantic Coastal Forest of the northern littoral of Paraná, Brazil (Figure 1). The principal purpose of this study was to perform an integrated market demand, macroeconomic, ecological, and institutional study of the prospects for ecotourism development in the Área de Proteção Ambiental (environmental protection area), or APA, which consists largely of the municipality of Guaraqueçaba in Paraná, Brazil.

The Atlantic Coastal Forest in the Northern Littoral Region of Paraná was selected for this case study based on the importance of the forest resource there and the mutual interests which have developed among scientists in Brazil and at several research organizations in North Carolina in the United States. The Atlantic Coastal Forest of Brazil has been designated as a Biosphere Reserve by UNESCO's Man and the Biosphere program, due to its large numbers of endemic species and high rates of habitat loss and fragmentation. The portion of the Atlantic Coastal Forest near Guaraqueçaba is part of the largest remaining fragment of this threatened ecosystem. The montane rain-forests and associated coastal resources of beaches, mangroves, wetlands, and estuaries form a physiographically and biologically diverse area that has considerable importance for resource protection and potential for ecotourism development. The forests' proximity to the major metropolitan centers of Curitiba and São Paulo and the coastal beaches of Paraná increases development pressures but also offers opportunities for ecotourism as an alternative to traditional timber harvesting, agriculture, or ranching.

This paper briefly summarizes the results from our interdisciplinary study on the potential impacts of ecotourism in the Atlantic Coastal Forest and associated marine environments in the Northern Littoral of Paraná, Brazil. Each of the studies described here involved considerable research and analysis, and cooperation among many U.S. and Brazilian personnel. Dozens of people and organizations cooperated in part in the study, and not all can be listed here. Instrumental cooperating organizations are listed in Table 1.

In most cases, considerably more details are available in other papers related to specific components of the project. Those that have been published are listed as references in this summary. Draft papers or other documents on other parts of this study may be obtained by

requests to the authors, written in care of the Forestry Private Enterprise Initiative address listed on the cover page.

PROJECT SUMMARY

This interdisciplinary study on ecotourism in the Área de Proteção Ambiental (APA) in Paraná, Brazil has yielded various products. A compilation of the laws regarding the management of natural resources in the APA was published. The economic model of the region and analysis of tourism's potential impacts have been completed. Mapping of roads, tourist attractions and land cover has been largely completed, and ecological risks identified. The market study for ecotourism and reports with preliminary conclusions on the supply and demand are finalized. Technical visits to other conservation units served as the basis for an analysis of strategies for the management of tourism.

Laws Governing Conservation Units

A plethora of federal and state environmental laws have been enacted to protect the Atlantic Coastal Forests, either specifically or as part of broader legislation (Table 2). Most of the Atlantic Coastal Forests in Paraná receive modest protection by inclusion in various federal and state environmental protection areas, or *Área de Proteção Ambiental de Guaraqueçaba* (APA). The federal Forest Code (*Código Florestal*) provides general guidelines and requires management plans for timber harvests on private lands. The federal *Mata Atlântica* decree limits timber harvests or land clearing activities to young growth forests. The state also passed a "Beraldin

Law" that remits a share of the state value added taxes back to municipalities with protected areas, including APAs. Various other laws, regulations, and planning efforts govern land management activities and development in the APA.

The comprehensive set of legal protections in the APA are hampered by modest funding and staffing of the government agencies which administer them, and by the pressing demands of local residents for improved standards of living. Continued protection of the Atlantic Coastal Forests must rely on balanced enforcement of existing legal authorities coupled with improved means of generating local income and economic development.

Domestic Demand for Ecotourism

To evaluate the domestic demand for ecotourism in the Guaraqueçaba APA, intercept interviews were conducted with (i) 648 tourists in various recreation areas throughout the coastal and mountainous areas of Paraná and (ii) 79 residents and visitors to Curitiba. The results of the survey in Curitiba are reported at the end of this section, because they have not yet been integrated with the larger survey. Most of the respondents to the larger survey were from southern and southeastern Brazil. The average age of respondents was 33 years. About 55 percent of the respondents had some university education and the average monthly income was about $1120. Sixty-two percent of the respondents had heard of the Guaraqueçaba APA, 14 percent had visited the APA, 2 percent had visited during the past year, 40 percent planned to visit in the future and 21 percent had tangible plans to visit. These results suggest that the annual demand for visits to the APA from Brazilian tourists is growing (assuming that all planned visits take place in ten years or less).

The economic value of recreation sites can be evaluated by estimating the economic measure termed "consumer surplus" created by providing access to natural areas. The consumer surplus associated with visits to "primitive" recreation sites (the Guaraqueçaba APA, Serra do Mar and Ilha do Mel) was estimated using a "typical trip" travel cost model. The model was estimated using data on trip frequency, distance traveled, perceived site quality ratings, and socio-economic variables. Travel cost model results are reported in Table 3.

As expected, as the travel cost of visits to primitive recreation sites increases, the number of visits decreases. This is shown as the negative coefficient on cost in Table 3, which indicates a negatively sloped demand curve. Older people and women generally take fewer trips to these sites than do younger people and men. More importantly, an increase in the perceived naturalness of a primitive recreation site shifts the demand for visits outward, increasing the recreational value. In a similar fashion, increases in infrastructure cause a decrease in demand for primitive recreation, reducing recreational value. For Brazilians visiting primitive recreation sites, the protection of natural attributes is an important determinant of demand.

Using the model represented in Table 3, consumer surplus values were estimated and are reported in Table 4. Substantial economic value is generated by protecting natural areas in the region. The economic value created by protection of the Serra do Mar (about $140.47 per trip) is somewhat larger than the per trip value of visits to the APA (about $111.29 per trip). Both of these values are substantially larger than the per trip value of visits to Ilha do Mel (about $58.79 per trip) because, on average, the perceived naturalness is higher and the perceived infrastructure development is lower in the Serra and APA than at Ilha do Mel.

The aggregate consumer surplus received by tourists visiting the APA could be estimated by multiplying the consumer surplus per trip times the aggregate number of trips taken to the APA. For example, if 10,000 trips per year are taken to the Guaraqueçaba APA, then the aggregate economic value received by visitors to the APA would be about $1.1 million. As the ecosystems protected by the Guaraqueçaba APA becomes more scarce relative to developed recreation areas (such as commercial beaches) their aggregate economic value can be expected to increase both by an increase in the number of visits and an increase in the value per visit.

Can the economic value associated with protecting naturalness be used to improve conservation of natural resources in the APA? Because consumer surplus is a measure of the value of access to a natural area, it follows that part of the consumer surplus could be collected as an entrance fee to the APA. Responding to a contingent valuation question, ninety percent of the survey respondents indicated that they were willing to pay an entrance fee if the revenues would be used for protection of nature within the APA. The average amount people said they were willing to pay was about $3.50 per person per visit. Although this amount may seem modest, entrance fees are not commonly collected at natural areas in Brazil. Further, this average amount is slightly higher than fees collected at Iguaçu Falls.

Direct (contingent valuation) and indirect (travel cost) measures of willingness to pay for the protection of nature in the Guaraqueçaba APA should yield similar results. Using individual recreationist data, the direct measure of willingness to pay was regressed on the indirect measure computed from the typical trip travel cost model and other socio-economic characteristics. The correlation between the direct and indirect measures of economic value was statistically significant at the 0.05 level. This result indicates that stated willingness to pay to protect nature in the APA

is consistent with economic measures of recreation behavior and, therefore, provides confirmation of the general validity of the results.

In summary, a survey of Brazilian recreationists was undertaken to evaluate the domestic demand for ecotourism. Using travel cost analysis, the "naturalness" of a recreation area was identified as an economic good and "infrastructure" was identified as an economic bad for people who visit primitive recreation sites such as the APA. A widespread willingness to pay for nature protection in the Guaraqueçaba APA was also identified and was highly correlated with recreational demand. These results suggest that an ecotourism market for the Guaraqueçaba APA could be developed by: (i) protecting the naturalness of the area, (ii) targeting people who enjoy primitive recreation and (iii) providing low-impact access to the various ecosystems that are found there (such as mountain biking, hiking, and sea-kayaking). Infrastructure development should be done in a way that protects the natural appearance of the area. Collection of an entrance fee could facilitate resource conservation efforts if revenues were locally collected and utilized. Because "naturalness" is an attribute favored by international ecotourists, development of an environmentally sensitive ecotourism market in the Guaraqueçaba APA could attract international tourists as well.

In July 1994, 79 intercept interviews were conducted in Curitiba in order to collect data on the general population of potential recreationists for comparison with actual recreationists in the coastal and mountainous areas. Approximately 70 percent of the respondents were from Curitiba; most of the remaining 30 percent were visiting Curitiba from homes in southern and southeastern Brazil. The average age (35 years) and percent of respondents with university education (50

percent) are similar to the results of the survey in the littoral. Average monthly income (US$2400) is higher than in the littoral survey, although this may be an artifact of the change in currency in Brazil. Sixty-six percent of the respondents had heard of the Guaraqueçaba APA, 22 percent had visited the APA, 11 percent had visited during the past year, 32 percent planned to visit in the future, and 15 percent had tangible plans to visit. Thus, a higher percentage had heard of and visited the APA, but a lower percentage planned to visit in the future. The average entrance fee people were willing to pay to visit the APA was also lower, at approximately US$2. This indicates that extrapolation of future demand for visits to the APA and willingness to pay for those visits from the survey in the littoral to the general population of potential recreationists may result in overestimation. As expected, the sample interviewed in the littoral evidently contains more avid recreationists who place a higher value on access to the Guaraqueçaba APA.

Supply of Tourism Services

In March 1994, 23 persons or groups who provide services to tourists in the APA Guaraqueçaba were interviewed. Further information was acquired through meetings, conversations, and informal sessions with the local communities, guides, and operators. Tourism in the APA Guaraqueçaba has almost tripled since 1990. Those interviewed believe ecotourism to be an economic contributor for improving the local population's quality of life, but they fear being excluded from the development process. Forty-three percent of the tourism enterprises belong to people who were born and raised in the APA.

Sixty percent of the interviewees believe that the government should tax tourism services, with revenues ear-marked for local conservation, not returned to the state. Fifty percent of those

interviewed said that they could charge a premium for some local product (candy, cheese, bananas, sap, honey, manioc, sea products, caramel, flour, clay pots, fishnets, and other local crafts), with a special "local label" indicating that the price premium would be returned to the producer. The principal concerns of the interviewees in relation to increased tourism are: lack of infrastructure basic sanitation, refuse, violence, drugs, loss of local tranquillity, degradation of nature, pollution of the rivers and the bay, lack of control, and the need for environmental education. In a May 1995 meeting during which the results of the study were presented, local residents suggested the creation of an association to organize tourism services (principally guides and boatmen) and called for the support of a local municipal secretary of tourism.

Case Studies in Conservation Units in the Atlantic Coastal Forest

The success of ecotourism in other protected areas in the Atlantic Coastal Forest was evaluated through visits to the areas and interviews with staff, tourism businesses, and local residents. Few of the areas have had significant success in bringing economic benefits to local people, since there is a tendency of better capitalized businesses from outside the region to capture most of the tourism revenue. Tourism does generate funds for management of a number of the protected areas. Table 5 summarizes the parks visited and their principal administrative authority.

Since few private organizations or enterprises can afford to purchase and preserve large tracts of forest, government financing is essential for the establishment of most protected areas. Private organizations, however, do play an important role in capturing revenue from tourists and channeling it into the maintenance of these areas. Local nongovernmental organizations or even

quasi-public foundations have the flexibility to make ecotourism revenues immediately available to park managers, thus filling a gap often left by bureaucratic government budget procedures. Maintenance of protected areas in turn helps ensure continued demand for and revenues from tourism.

Regional Economic Model

An economic model termed a Social Accounting Matrix (SAM) was developed to describe the structure of the regional economy of the APA Guaraqueçaba. A SAM was chosen for three reasons. First, regional economic data are often gathered by different governmental agencies and stored in different formats. A SAM provides a concise framework for synthesizing and displaying the data on a region's economy. Second, a SAM describes the structure of an economy: production activities, income distribution, consumption of goods/services, savings and investment, and trade. A SAM, therefore, describes the links between demand, production, and income within a region's economy. This allows for developing regional economic multipliers and estimating the impacts of ecotourism on production, employee compensation, value added, and income distribution. Finally, it allows for estimating the impacts of structural changes in the regional economy.

The results indicated that approximately 95% of the working age population, assuming the working age to be between 15 and 69, worked in the subsistence economy. In addition, approximately 95% of the goods purchased by local businesses in the region were imported from other parts of Brazil. Tables 6, 7, 8a, 8b, and 9 summarize the regional employment estimates, economic output multipliers, ecotourism expenditures, and potential ecotourism impacts.

Ecotourism expenditures for hotels or food may be re-spent on wages or agricultural/fishing products, thus creating "multiplier effects" (Table 7). Type I regional economic output multipliers ranged from 1.0 (all economic inputs were imported) to 1.56 (fewer economic inputs were imported). The Type I multipliers were estimated using only intra-business transactions and were estimated using direct and indirect effects:

Direct Effect - The immediate impacts associated with the change in demand for a particular good or service. For example, the direct effect of an ecotourist purchasing a hotel room or meal is the price of the hotel room or meal.

Indirect Effect - The secondary impacts caused by the changing input needs of the directly impacted activity. For example, the indirect effects would include the purchases of breakfast supplies from the local market.

The SAM output multipliers ranged up to about 5.5. These multipliers were larger for three reasons. First, they accounted for the intra-business transactions. Second, they accounted for the economic impacts of an increase in households' purchases of goods and services due to increased wage household income from an ecotourist purchasing a hotel room. Finally, they accounted for the economic impacts of an increase or decrease in household savings due to an ecotourist purchasing a hotel room.

A companion study estimated that an ecotourist would spend $16.00 per day (Table 8a). Table 8b shows that approximately 60% of ecotourism expenditures would go to the service sector, 20% to other businesses, 10% to transportation. In addition, this study estimated that approximately 7,500 ±2,500 ecotourists would visit the area per year. Table 9 predicts the economic impacts of their combined expenditures would generate $315,450 worth of additional goods and services. In addition, these expenditures could create 53 full-time equivalent (FTE) jobs and an overall salary payment of $26,700. Given the existing structure of Guaraqueçaba's

economy, ecotourism will generate a reasonable number of FTE jobs. However, the vast majority of the FTE jobs created will pay only one minimum salary wage. This is due to the fact that ecotourists spend the majority of their money in the service and commercial sectors whose wage payments are not much better than those earned currently by subsistence households. The majority of the money spent by ecotourists will accrue to the business owners and to pay for imports.

Increasing purchases of locally produced inputs will do the most to improve regional quality of life. If an ecotourism business activity could be developed that principally targeted purchasing outputs from local farmers and fishermen (e.g., vegetables and shrimp for local restaurants) and purchasing souvenirs from local artisans (perhaps made on site), then more of the ecotourist's dollars would be re-spent within the region creating more economic benefit. For example, local residents could become tour guides for hiking or boating, could help build and mark trails and information facilities, and could build locally owned hotels, *pousadas*, and lodges. Signs such as "We purchase locally" and "Locally owned" could encourage ecotourists to support firms that generate the most local economic activity. In addition, if the capital for establishing these tourism businesses could be raised locally (e.g., local cooperatives), then the profits from these businesses would also remain within the region and distributed to it members instead of a single, possibly external, owner.

Ecological Impacts and Geographic Information System

Trampling of vegetation, erosion, and littering along trails are damages commonly associated with ecotourism activities. Except for particularly fragile areas such as dunes, these impacts

mostly affect tourist enjoyment of the area, and can be minimized by education and by careful design and maintenance of trails. A greater threat to ecosystems themselves is the impact of ecotourism on wildlife. Improvements in access should be undertaken with care, especially into remote areas, and monitoring of impacts can help to determine appropriate levels of use.

We have created a computerized digital map of current land use and vegetation cover in the APA to aid planning of ecotourism activities and monitoring of deforestation. This map provides data for a Geographic Information System (GIS) that can be used in planning and analysis of activities in the APA. Copies of the maps and the GIS database will be shared with interested government and nongovernmental organizations in Paraná.

SUGGESTIONS

This project has examined the demand for and potential impacts of ecotourism in the Guaraqueçaba region in Paraná, Brazil. Ecotourism has many definitions, but we refer to it generally as tourism activities that are based on observing and enjoying nature, rather than more intensive development efforts that would significantly alter its current state. Our technical studies show that there is good potential for increasing ecotourism in the APA Guaraqueçaba. Based on our studies and discussions with people in Guaraqueçaba, we identified some actions that might help encourage ecotourism, protect nature, and generate local income and employment.

Our suggestions follow: (1) Promote the use of local agriculture and fishery products. (2) Develop the manufacture and sale of local handicraft products, including having persons make crafts in local shops. (3) Construct well planned, clearly marked and easily found trails and

maintain them well. (4) Use local knowledge of the natural history of the APA Guaraqueçaba to share with tourists, expanding that knowledge through environmental education efforts and training guides to work with tourists. (5) Prepare nature interpretation signs and plaques for trails. (6) Distribute "nature tourism" maps of the region widely to tourists, by providing them in most shops, hotels, and information centers. (7) Promote ecotourism in travel agencies in metropolitan areas and ensure that road information centers have and use ecotourism information. (8) Develop businesses to rent sports equipment to ecotourists, such as boats, canoes, bicycles, or fishing gear. (9) Facilitate boat transportation and access to the Guaraqueçaba Protected Area by boat. (10) Be friendly and helpful with nature tourists seeking information or using facilities in the Protected Area, and ensure their security. Many other suggestions surely are viable, and perhaps not all of these are practical. The information we have provided can be used as most appropriate by local interests, entrepreneurs, and government planners for enhancing nature-based tourism in the Guaraqueçaba Protected Area.

RESUMO DO PROJETO

Este estudo de ecoturismo na APA de Guaraqueçaba já tem vários produtos finais. Uma compilação sobre as leis de manejo de recursos naturais da APA foi publicado. O modelo da economia regional e a análise dos impactos potenciais são completos, e tambem dos resultados das análises dos impactos ecólogicos e socioculturais. Do estudo do mercado para ecoturismo, os relatórios com as conclusões preliminares sobre a demanda e a oferta estão finalizados. Visitas

técnicas a outras unidades de conservação serviram como a base para uma análise das estratégias para manejo de turismo.

Resumo do Leis

As leis, resoluções, e normas que regulamentam o uso e conservação da Mata Atlântica na Área de Proteção Ambiental (APA) de Guaraqueçaba, Estado do Paraná, Brasil são revisadas (Tabela 1). A Floresta Atlântica está simultaneamente entre os ecosistemas mais ricos em diversidade biológica e mais ameaçados do mundo. Há uma lista numerosa de leis federais e estuduais regulamentado o uso e proteção da APA de Guaraqueçaba; alem disso há diversas outras leis indiretas que também exercem influência sobre a jurisdição da APA. O conteúdo, a administração, e a efetividade dessas leis são discutidas. A melhoria da proteção da APA irá depender da compatibilização da legislação, do fortalecimento dos orgãos públicos responsáveis pela APA, bem como do desenvolvimento de uma economia viável e sustenável que possibilite aos moradores locais um aumento da renda a partir do uso e manejo dos recursos naturais.

Mercado para Ecoturismo

Para avaliar a demanda domestica para ecoturismo na APA de Guaraqueçaba, foram entrevistados (i) 648 turistas em várias áreas de recreação no litoral e serra do mar do Paraná, e (ii) 79 moradores e visitantes a Curitiba. Os resultados da pesquisa em Curitiba são resumidos no final desta seção porque ainda não foram integrados com a pesquisa maior. A maioria dos turistas entrevistados no litoral e serra do mar eram do sul e sudeste do Brasil. A idade média era 35 anos. Aproximadamente 55% tinham curso superior e a renda bruta familiar média era US$1120.

66% dos entrevistados já tinham ouvido falar da APA de Guaraqueçaba, 14% já tinham visitado a APA, 2% tinham visitado durante o último ano, 40% tinham planos de visitar no futuro, and 21% tinham planos concretos de visitar a APA no futuro. Estes resultados indicam que a demanda para visitas à APA está aumentando.

O valor econômico dos destinos turisticos pode ser quantificado como o "consumer surplus" que é resultado do acesso a estas áreas. O "consumer surplus" associado com a APA de Guaraqueçaba, a Serra do Mar, e a Ilha do Mel foi estimado com um modelo chamado "typical trip." O modelo exige dados sobre o número de viagens, as distâncias das viagens, as opiniões dos turistas sobre a qualidade dos locais, e os caraterísticos socioeconomicos dos turistas. Tabela 3 tem os resultados.

O número de visitas a uma área é menor, quanto maior a distância da residencia à área. (Veja Tabela 3.) Os mais velhos e as mulheres visitam estas áreas com menor freqüência de que os jovens e os homens. As áreas que são percebidas de ser mais "natural" e intocada (que contem mais natureza preservada) tem maior demanda para visitas, e portanto maior valor. Aumentos na infrastrutura resultam em menor demanda e redução do valor. Para Brasileiros visitando destinos turisticos primitivos e naturais, a proteção da natureza é um componente importante da demanda para visitas.

Utilizando os resultados da Tabela 3, os valores de "consumer surplus" foram calculados e são apresentados na Tabela 4. Há bastante valor econômico gerado por proteção da natureza. O valor econômico da proteção da Serra do Mar (US$140,47 por viagem) é maior de que o valor por viagem à APA (US$111,29). Ambos são maior de que o valor por viagem à Ilha do Mel

(US$58,79) porque, em geral, a preservação da natureza é maior e a infrastrutura é menor na Serra e na APA de que na Ilha.

O valor total do “consumer surplus” de todos os visitantes à APA seria o “consumer surplus” por viagem multiplicado pelo número total de viagens à APA. Por exemplo, com 10.000 viagens por ano à APA de Guaraqueçaba, o valor total seria aproximadamente US$1,1 milhão. Se as ecosistemas protegidas pela APA viram-se mais escassos relativo a áreas mais desenvolvidas, o valor da APA como destino turistico aumentaria como resultado de mais visitantes e de maior valor por viagem.

Pode utilizar o valor resultado da preservação da natureza para a conservação dos recursos naturais da APA? “Consumer surplus” é uma medida do valor econômico de acesso a uma área natural, por conseguinte um parte do valor podia ser cobrado como taxa de entrada. Em resposta a uma pergunta do tipo “contingent valuation,” 90% dos entrevistados indicaram que pagariam uma taxa de entrada se a receitas fosse em benefício da proteção da natureza na APA. A taxa média que os entrevistados foram dispostos a pagar foi $3,50 por pessoa por visita. Embora que parece uma taxa pequena, tem que levar em conta que taxas de entrada para unidades de conservação não são comuns no Brasil. Além disso, esta taxa média é similar à taxa cobrada no Parque Nacional do Iguaçu.

Medidas derivadas de metodologias diretas (contingent valuation) e indiretas (travel cost) da vontade à pagar uma taxa de entrada à APA de Guaraqueçaba devem ser similares. Então a medida direta de cada entrevistado foi avaliada numa equação regressiva que inclui a medida indireta (do modelo “typical trip”) e caracteristicas socioeconômicas. A correlação entre as medidas diretas e indiretas tem significado estatístico (nível .05). Este resultado mostra que a

resposta à pergunta sobre vontade de pagar uma taxa de entrada é consistente com medidas de valor reveladas nas ações dos turistas (número e distância viajada), e portanto verifica a validade dos resultados.

Em resumo, turistas e excursionistas Brasilieros foram entrevistados para avaliar a demand domestica para ecoturismo. A análise "travel cost" mostra que a natureza de uma área de recreação tem uma influência positiva na demanda, enquanto infrastrutura tem uma influência negativa na demanda entre Brasilieros que visitam áreas "primitivas" como a APA. A maioria dos entrevistados são dispostas a pagar uma taxa de entrada, e a taxa é correlatada com a demanda observada para visitas ao litoral paranaense. Estes resultados sugeriram que pode desenvolver o mercado para turismo à APA de Guaraqueçaba por meio do seguinte: (i) proteger a natureza na APA, (ii) atrair gente que gostam de recreação em áreas primativas, e (iii) estabelecer modos de acesso de impacto mínimo às ecosistemas da APA (como bicicleta, trilhas de "trekking," e caiaque). Qualquer infrastrutura não deve interferir com a paisagem natural da área. Uma taxa de entrada podia subsidiar proteção da natureza se as receitas fossem cobrado e investido no local. O desenvolvimento de um estilo de turismo adequado à preservação e desfrutação da natureza pode atrair turistas internacionais pela razão de turistas internacionais são também preferirem visitar áreas com natureza bem preservada.

Em julho de 1994, 79 entrevistas foram completadas em Curitiba para obter dados sobre a população geral de recreacionistas potenciais, quais dados podem ser comparados com os resultados da pesquisa com a população de recreacionistas atuais no litoral. Aproximadamente 70% dos entrevistados eram de Curitiba, e 30% eram visitando Curitiba mas moravam em outras

cidades do sul e sudoeste do Brasil. A idade média (35 anos) e porcentagem de entrevistados com curso superior (50%) são similares aos resultados da pesquisa no litoral. A renda bruta familiar mensal (US$2400) era maior de que na pesquisa no litoral, fato que pode ser resultado da mudança de moeda no Brasil. De todos os entrevistados, 66% tinham ouvido falar da APA de Guaraqueçaba, 22% tinham visitado a APA, 11% tinham visitado durante o ano passado, 32% tinham planos de visitar no próximo ano, e 15% tinham planos definidos de visitar. Assim, uma porcentagem maior tinha ouvido falar e visitado à APA, mas uma porcentagem menor tinham planos de visitar no futuro. A taxa de entrada média que os entrevistados foram dispostos a pagar também era menor de que no litoral: aproximadamente US$2. Estes resultados indicam que prognosticação (da demanda futura para visitas à APA e a vontade a pagar uma taxa de entrada) baseada nos resultados da pesquisa no litoral pode exagerar a demanda da população Paranaense. Os entrevistados no litoral são mais dedicados a atividades de recreação e turismo de aventura e acham que accesso à APA de Guaraqueçaba é mais precioso.

Oferta de Serviços de Turismo

Em março de 1994 foram entrevistados 23 pessoas que oferecem serviços à turistas na APA de Guararqueçaba, assim como buscou-se informações em reuniões, palestras e encontros informais com as comunidades locais, guias e operadores. O movimento turístico na APA de Guararqueçaba praticamente triplicou a partir de 1990. Os entrevistados acreditam no Ecoturismo como alternativa econômica para a melhoria da qualidade de vida de população local, mas temem ser excluídos do processo. Quarenta e três por cento dos estabelecimentos são de pessoas que nasceram e estudaram na APA. O governo deveria arrecadar uma taxa sobre os

serviços de turismo na opinião de 66, 6% dos entrevistados, mas temem que a renda se perca na receita pública do Estado. Cinqüenta por cento dos entrevistados concordariam em cobrar taxas sobre produtos locais (doces, queijos, bananas, sucos, mel, mandioca, frutos do mar, balas, farinha, vasos de barro, redes de pesca, e outros artesanatos locais) com selos especiais. As principais preocupações dos entrevistados em relação ao aumento do turismo são: falta de infra-estrutura, saneamento básico, lixo violência, drogas, perda da tranqüilidade do local, depredação de natureza, assoreamento e poluição dos rios e baía, falta de fiscalização e de Educação Ambiental. Os moradores locais, em recente encontro para apresentação dos resultados deste estudo, sugeriram a criação de uma associação para organizar os serviços de turismo (principalmente guias e barqueiros) e gostariam de ter o apoio de uma secretaria municipal de turismo.

Estudos de Caso em Unidades de Conservação na Mata Atlântica

A realização do ecoturismo em outras áreas protegidas da Mata Atlântica foi avaliada através de visitas às áreas e entrevistas com funcionários, empresários de turismo, e a população local. Poucas áreas estão trazendo benefícios econômicos à população local, desde que negócios de fora mais capitalizados entram no mercado local e capturam a maioria dos lucros de turismo. Turismo é um fonte de recursos para o manejo de algumas das áreas protegidas.

Pela razão de poucas organizações ou empresas dispoem de recursos suficientes para comprar e preservar grandes áreas de floresta, cabe ao governo estabelecer a maioria das áreas protegidas. Não obstante, o setor privado pode cumprir um papel importante de capturar recursos financeiros de turistas e direccionar estes recursos à manutenção destas áreas. Organizações não-

governmentais locais ou fundações quasi-publicas têm a flexibilidade de utilizar receitas de turismo para as necesidades imediatas da administração de área protegidas, sem a demora de burocracia. A manutenção de áreas protegidas por sua vez incentiva demanda para visitas à área.

Modelo da Economia Regional

Um modelo econômico tipo "Social Accounting Matrix" (SAM) foi construido para descrever e entender a economia regional da APA de Guaraqueçaba. Houve três justificações para o uso do SAM. Primeiro, várias agências do governo coletam dados econômicos regionais e arquivam em formatos diferentes. O SAM serve para organizar estes dados. Segundo, o SAM descreve a estrutura da economia regional, incluindo fabricação, distribuição de renda, consumo de bens e serviços, poupanças e investimentos, e comércio. O SAM descreve a articulação da demanda, fabricação, e renda na economia regional. Por conseguinte, pode calcular os multiplicadores e os impactos de ecoturismo na produção, salários, valor adicionado, e distribução de renda. Por final, o SAM pode ser utilizado para estimar os impactos de mudanças estructurais na economia.

Os resultados mostram que aproximadamente 95% da população trabalhador (de 15 a 69 anos) faz parte da economia de subsistência. Aproximadamente 95% dos bens comprados por empresas locais são importados de outras regiões. As tabelas 6, 7, 8a, 8b, e 9 sumariam as estimativas de emprego, multiplicadores, gastos de turistasm, e impactos potenciais de turismo.

Os gastos dos turistas para hoteis ou comida podem ser gastado uma segunda vez na economia local, para salários, produtos agricolas, ou peixe e frutos do mar, gerando efeitos multiplicadores (Tabela 7). Multiplicadores do primeiro tipo alcance 1 (tudo importado) até 1.56

(menos importados). Estes multiplicadores refletam só transações entre estabelecimentos comerciais e foram calculados baseado em efeitos diretos e indiretos:

Efeito direto: os impactos imediatos resultando da nova demanda para bens ou serviços. Por exemplo, o impacto direto de um turista que fica num hotel e janta numa restaurante é o preço do pernoite e o custo da jantar.

Efeito indireto: of impactos secondarios resultados da demanda nova para insumos requeridos pela produção do bem or serviço com demanda ampliada. Por exemplo, os impactos indiretos incluem a compra de pão e cafe para preparar cafe da manhã nos hoteis.

Os multiplicadores de produção do SAM alcance 5.5. Estes multiplicadores são maiores por tres razões. Primeiro, incluem as transações entre estabelecimentos comerciais. Segundo, incluem os impactos do aumento em compras privadas de bens e serviços como função do aumento na renda privada de empregados dos estabelecimentos comercias que servem turistas. Por final, incluem os impactos de mudanças na quantia de poupanças na economia regional.

O estudo do mercado para turismo determinou que um turista gasta $16 por dia na APA de Guaraqueçaba (Tabela 8a). Tabela 8b mostra que aproximadamente 60% dos gastos dos turistas são no setor de serviços, 10% no setor de transporte, e 20% em outros setores. O estudo do mercado também estimou que aproximadamente 7,500 ± 2,500 turistas visitariam a APA por ano. Como mostrado por Tabela 9, os impactos predizados dos gastos deste número de turistas são $315,450 de bens e serviços adicionais. Estes gastos gerariam 53 empegos (equivalência a emprego de tempo enteiro), com um total de $26,700 de salarios. Dado a estrutura atual da APA de Guaraqueçaba, turismo pode gerar bastante empregos. Por outro lado, a maioria destes

empregos pagariam só um salario minimo, porque of turistas gastam mais nos setores de serviços e comercios que pagam salarios pouco melhor de que a renda de produção de subisistencia. A grande maioria das receitas de turismo é acumulado pelos empresarios ou utilizado no pagamento de importados de outras regiões do Brasil.

Aumentação da compra de insumos produzidos na área local teria o maior impacto na qualidade da vida da região. Deve promover o desenvolvimento de empreendimentos que compra insumos principalmente de produtores rurais (e.g., verduras), pescadores (e.g., camarão), e artisões (artesenato feito no ponto da venda) da região; assim, uma proporção maior das despesas dos turistas seria gastado na região, gerando maiores benefícios. Por exemplo, habitantes locais podiam ser guias para passeios na floresta ou de barco, podiam trabalhar na construção de trilhas e centros de informação, e podiam construir hoteis, pousadas, e alojamentos para turismo. Placas avisando que uma empresa "Se-Compra Produtos Locais" ou que é de "Dono Natural da Guaraqueçaba" incentivariam turistas de patronizar empresas que geram a maior atividade local. Se o capital de investimento nestas empresas também era local, of lucros ficariam na região em vez de revertir a um dono de fora.

Impactos Ecológicos e Sistema de Informação Geográfica

Pisadas na vegetação, erosão, e lixo deixado ao longo das trilhas são danos comuns resultados de ecoturismo. Fora de áreas muito frageis como dunas, estes impactos prejudicam o experiência turistica mais de que o meio ambiente, e podem ser minimizado por educação, e planejamento e manutenção cuidadoso de trilhas. A ameaça maior aos ecosistemas é o impacto de turismo na vida selvagem. Melhorimentos de accesso devem ser avaliados e planejados cuidadosamente, em

particular em áreas remotas, e os impactos devem ser fiscalizados e estudados para determinar o nível de uso mais adequado à APA.

Produzimos um mapa digitalizado do uso da terra e cobertura vegetal na APA para auxiliar planejamento de ecoturismo e monitoriamento de desflorestamento. Este mapa fornece dados para um SIG que servirá para planejamento e análise de atividades na APA. Cópias dos mapas e do SIG será compartilhados com organizações governmentais e não-governmentais no Paraná.

SUGESTÕES

Baseando-se nos estudos e nas discussões com as comunidades em Guaraqueçaba, algumas sugestões poderiam ser feitas para encorajar o Ecoturismo, proteger a natureza, e gerar empregos e receita local:

1. Promover o uso de produtos locais (agricultura e pesca);
2. Incrementar a confecção e comércio de artesanato regional, criando espaços para vendas de produtos e apreciação do artesão trabalhando no local;
3. Construir trilhas bem planejadas e sinalizadas, realizando contínua manutenção;
4. Compartilhar com os turistas os conhecimentos dos nativos sobre a natureza da APA, e expandi-los através de ações de Educação Ambiental e no treino de guias locais;
5. Implantar placas para orientação na APA e informações ambientais;
6. Confecçionar mapas da região e distribuir nos locais freqüentados por turistas;
7. Promover e divulgar o Ecoturismo na APA, em agências de viagens e nos centros de informações dos pólos emissores;

8. Incentivar a criação de empresas para aluguel de equipamentos esportivos, tais como barcos, caiaques, bicicletas e pesca;
9. Facilitar o acesso e transporte á APA, principalmente por barco;
10. Ser amigável e prestativo com os ecoturistas que buscam informações e usam as facilidades da APA, garantindo a sua segurança.

Table 1. Organizations Involved in Study of Ecotourism in APA Guaraqueçaba

Primary Organizations

USDA Forest Service

- Economics of Forest Protection and Management Research Work Unit, Raleigh, North Carolina, USA
- International Forestry, USDA Forest Service, Tropical Forestry Program Washington, DC USA

Duke University, School of the Environment, Durham, NC, USA

North Carolina State University, Department of Forestry, Raleigh, NC, USA

Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental (SPVS), Curitiba, Paraná

Secondary Organizations

Center for World Environment and Sustainable Development, Raleigh, Durham, Chapel Hill, NC, USA

Universidade Federal do Paraná

- Núcleo Interdisciplinar de Meio Ambiente e Desenvolvimento (NIMAD)
- Centro Integrado de Estudos em Geoprocessamento (CIEG)
- Departamento de Turismo
- Departamento de Silvicultura e Manejo
- Departamento de Geosciências

Pontifical Universidade Católica

Estado do Paraná

- Instituto Paranaense de Desenvolvimento Econômico e Social (IPARDES)
- Secretaria Especial do Esporte e Turismo
- Instituto Ambiental do Paraná (IAP)

Governo Federal

- Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)
- Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA)

Officials of the Prefeitura of Guaraqueçaba

Table 2. List of Environmental Protection Laws Affecting the APA Guaraqueçaba

Federal Laws and Decrees

(1) Federal Decree 90.883/85, as authorized by Federal Law 6902/81, The Environmental Protection Area of Guaraqueçaba (Área de Proteção Ambiental (APA) de Guaraqueçaba, Decreto Federal 90.883/85, under authority of Federal Lei 6902/81). Declares the environmental protection area.

(2) Law 4771/65, the Forest Code Law (*Código Florestal*), as modified by Law 7803/89. General governance of forest harvesting and management in Brazil.

(3) Law 5197/67, The Law for Fauna Protection (*Lei de Proteção á Fauna*). General governance of wildlife.

(4) Decree 87222/82, The Ecological Station (*Estação Ecológico*) of Guaraqueçaba (14,000 ha, 1982).

(5) Decree 97688/89, The National Park (*Parque Nacional*) of Superagüí Island, including lands from the islands of Superagüí and Peças (30,000 ha, 1989).

(6) Decree 91888/85, The Relevant Ecological Interest Area (*Área de Relevante Interesse Ecológico* (ARIE)) of Pinheiro and Pinheirinho Islands (109 ha, 1985). Protection of roosting habitat for rare blue-cheeked parrot.

(7) Decree 99547/90, the *Mata Atlântica* (Atlantic Forest) Decree. Forbade all harvest of timber or clearing of land in Atlantic Forests in Brazil.

(8) Decree 750/93, the *Mata Atlântica* Decree (revised). Permits harvest and clearing of early growth, but not advanced growth.

State Laws

(1) Decree 2693/80, Protection of Areas of Special Interest (*Áreas de Especial Interesse*).

(2) Law 7389/80, Law of Coastal Land Use and Areas of Tourist Interest (*Áreas e Locais de Interesse Turístico-Lei de Uso do Solo do Litoral*). [Regulations to implement Law 7389/80].

(3) Decree 2722/84, Law Governing Land Use in Areas of Tourist Interest (*Áreas e Locais de Interesse Turístico-Lei de Uso do Solo do Litoral*).

(4) Decree 6754/85, Safeguarded Natural Areas, Serra do Mar and Artificial Island of Superagüí.

(5) Decree 5040/89, Approving the Regulations to Define Macro-Zoning for the Littoral Region of Paraná (*Macrozoneamento da Região do Litoral Paranaense*).

Related Laws

(1) Environmental Impact Assessments (Política Nacional do Meio Ambiente, Law 6938/81, as amended by Law 7804/89), requires environmental assessments; (Resolução 001/86 do Conselho Nacional do Meio Ambiente--CONAMA), leads to a "RIMA" (*Relatório de Impactos sobre o Meio Ambientel*) report on public or private lands.

(2) Coastal Zone Planning (*Plano Nacional de Gerenciamento Costeiro*, or PNGC, Law 7661/88).

(3) Ecological Royalties, Law 059/91, The Beraldin Law (*Lei Complementar no. 59, de 1 outubro 1991, or Lei Beraldin*) and the State Value-Added Tax on Goods and Services (*Imposto sobre Circulação de Mercadorias e Serviços, ICMS*). Returns added portion of state value added tax to municipalities containing APAs or other conservation units.

Table 3. Typical trip travel cost model of demand for visits to primitive recreation areas

Variable:	Coefficient	t-ratio
Constant	0.342	0.502
Cost	-0.007	-3.433
Age	-0.036	-3.307
Sex	-0.408	-2.274
Naturalness	0.417	3.660
Infrastructure	-0.173	-2.111

R^2 = 0.377
Number of observations = 212

Note: the travel cost model was estimated using truncated Poisson regression. The left-hand side variable in the regression was the number of trips taken to Serra do Mar, Ilha do Mel and the Guaraqueçaba APA. Travel costs were computed at $0.15/km.

Table 4. Consumer surplus estimates for trips to primitive recreation areas

Location	CS/trip	Trips/year	CS/year
Guaraqueçaba APA	$111.29	1.21	$134.66
Serra do Mar	$140.47	2.35	$330.11
Ilha do Mel	$58.79	1.16	$68.20

Note: CS stands for consumer surplus.

Table 5. Protected areas visited and principal administrative organizations

State	Protected Area	Administration
Alagoas	Paripueira Marine Park	Municipal
	Piacabuçu APA†	Federal
Bahia	Project Mico-Leão Baiano	Private/Federal
	Project Tamar/Praia do Forte Reserve	Federal
Minas Gerais	Caparaó National Park	Federal
	Caraça Park	Private/Federal
	Caratinga Reserve	Private
	Rio Doce State Park	State
Paraná	Anhangava	Private
	Guaraqueçaba APA†	Private/Federal
	Iguaçu National Park	Federal
	Ilha do Mel Reserve	State
	Marumbi Park	Federal
Rio de Janeiro	Itatiaia National Park	Federal
	Trindade/Cairuçu APA†	Private/Federal
	Serra da Bocaina National Park	Federal
Santa Catarina	Vila da Glória Reserve	Private
São Paulo	Alto Ribeira State Park	State
	Picinguaba State Park	State
	Mar Virado	Private

†APA = Área de Proteção Ambiental, or Environmental Protection Area

Table 6. Estimated Full-time Equivalent Employment in the Municipality of Guaraqueçaba, Brazil - 1989

Activity	Estimated FTE[§]		Total FTE Employment
	Formal	Informal	
Rudimentary Rural Farms		1298	1298
Rural Entrepreneurial	19	98	117
Construction	6	9	15
Manufacturing	137	454	591
Commercial	31	2	33
Service	13	1	14
Transportation	22	4	26
Government Industries	277	0	277
Total	505	1866	2371

§FTE denotes full-time equivalent employment. A full-time equivalent standardizes the unit of work to one year. Therefore, two 6-month part-time jobs or twelve 1-month part-time jobs equals 1 full-time equivalent job. Formal was defined as the number of employees with a formal employment contract. Informal was defined as the number of employees without a formal employment contract.

Table 7. Regional Economic Output Multipliers for the Municipality of Guaraqueçaba, Brazil

	Output Multiplier	
	Type I†	SAM‡
Activity		
Rudimentary Rural Farms	1.56	5.52
Rural Entrepreneurs	1.03	3.58
Construction	1.14	2.76
Manufacturing: Food Production	1.05	3.71
Commerce	1.07	3.46
Service	1.03	2.52
Transportation	1.00	2.12
Government Enterprise	1.00	3.81
Factors		
Indirect Business Taxes	-	1.96
Capital Rent	-	3.95
Labor: Households	-	4.06
Labor: Salary	-	2.81
Institutions		
Household: Subsistence	-	3.06
Household: Low	-	1.79
Household: Medium	-	1.83
Household: High	-	4.55
Capital for Investment	-	5.28
Enterprises	-	5.55
Government: Municipal	-	4.13
Government: State	-	-0.23
Government: Federal	-	105.62

†Type I output multipliers were estimated using only interindustry transactions.

‡Social Accounting Matrix output multipliers were estimated using the links between production, income, and consumption accounts.

Table 8a. Ecotourism expenditure information for the APA de Guaraqueçaba, Brazil

Daily expenditure per person =	$16.00
Fuel expenditures per person per day =	$2.13
Public transport expenditures per person per day =	$2.99
Hotel expenditures per person per day =	$5.40
Food expenditures per person per day =	$4.91
Camping expenditures per person per day =	$0.57
Number in party =	2 persons
Length of visit =	4 days
Total expenditure per trip	$128.00

The expenditures are in 1994 U.S. dollars and are averages of responses to survey of tourists.

Table 8b. Ecotourism expenditures by business activity for the APA de Guaraqueçaba, Brazil§

Activity	Expenditures per ecotourist per day	Expenditures per trip
Rudimentary Rural Farms	$0.00	$0.00
Rural Entrepreneurs	$0.00	$0.00
Construction	$0.00	$0.00
Manufacturing	$0.00	$0.00
Commerce	$3.28	$26.24
Service	$9.36	$74.88
Transportation	$3.36	$26.88
Government Enterprise	$0.00	$0.00
Total	$16.00	$128.00

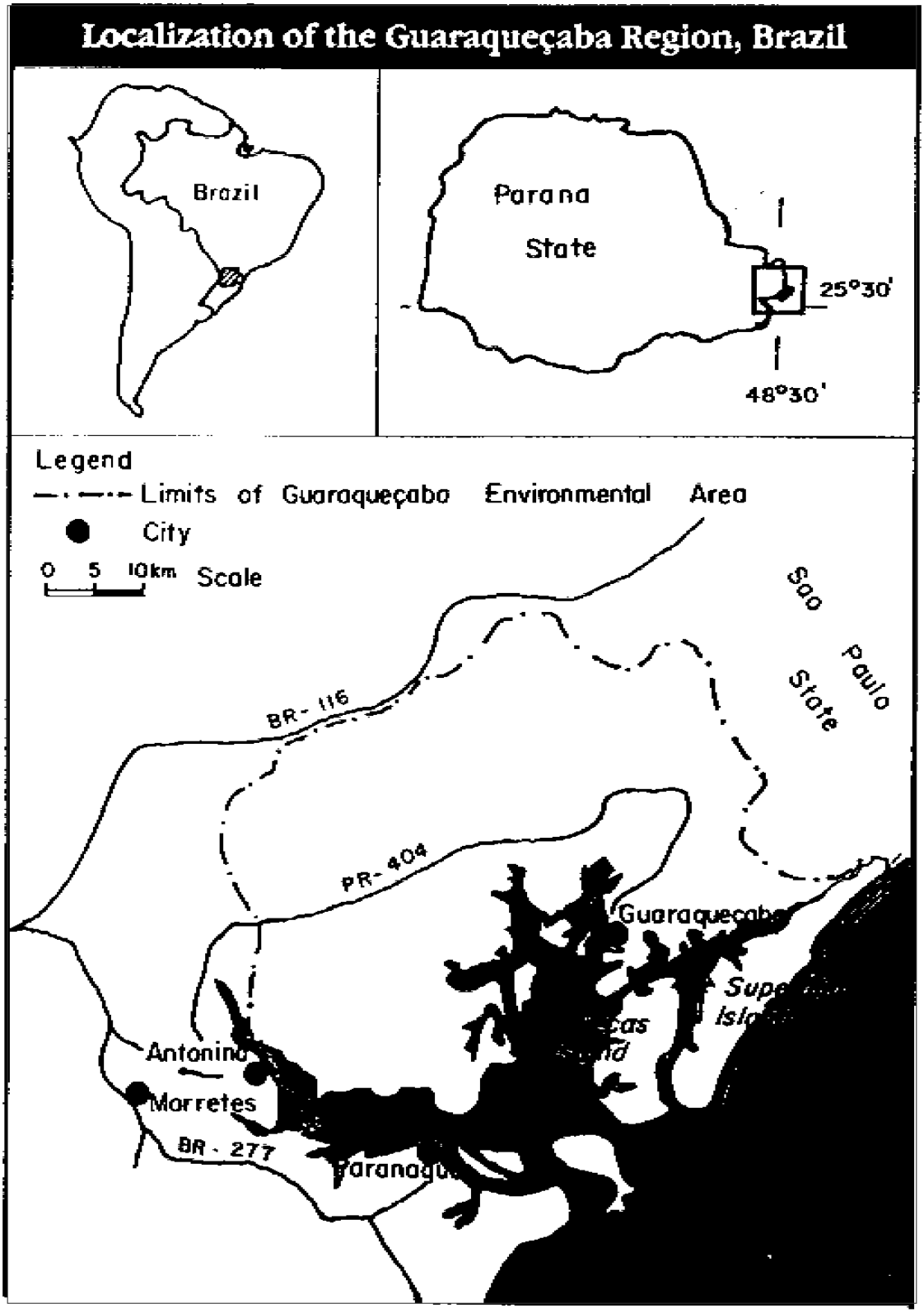
§The expenditures are in 1994 dollars and are averages of responses to survey of tourists.

Table 9. Estimated total regional economic impacts of 7,500 ± 2,500 ecotourist days for the Municipality of Guaraqueçaba, Brazil§

	Type I	SAM
Output ($)	130,125 ± 43,374	315,450 ± 105,150
FTE Employment† (jobs)	22.05 ± 7.35	53.25 ± 17.75
IBT‡ ($)	600 ± 200	750 ± 250
Labor‡‡		
Household ($)	1,350 ± 450	3,975 ± 1,325
Labor ($)	16,275 ± 5,425	22,725 ± 7,575

§Economic impacts were based on a total estimated expenditure per day of $16.00. The estimate of 7,500 ± 2,500 annual ecotourist days were reported by Holmes, personal communication.
†FTE defines full-time equivalent employment. The units are number of jobs.
‡IBT denotes indirect business taxes. The units are in US dollars.
‡‡Labor: Household and Labor: Salary denotes salary payments to employees without and with a formal employment contract, respectively. The units are in US dollars.

Figure 1. Map of APA Guaraqueçaba
(S.P.V.S., 1995)



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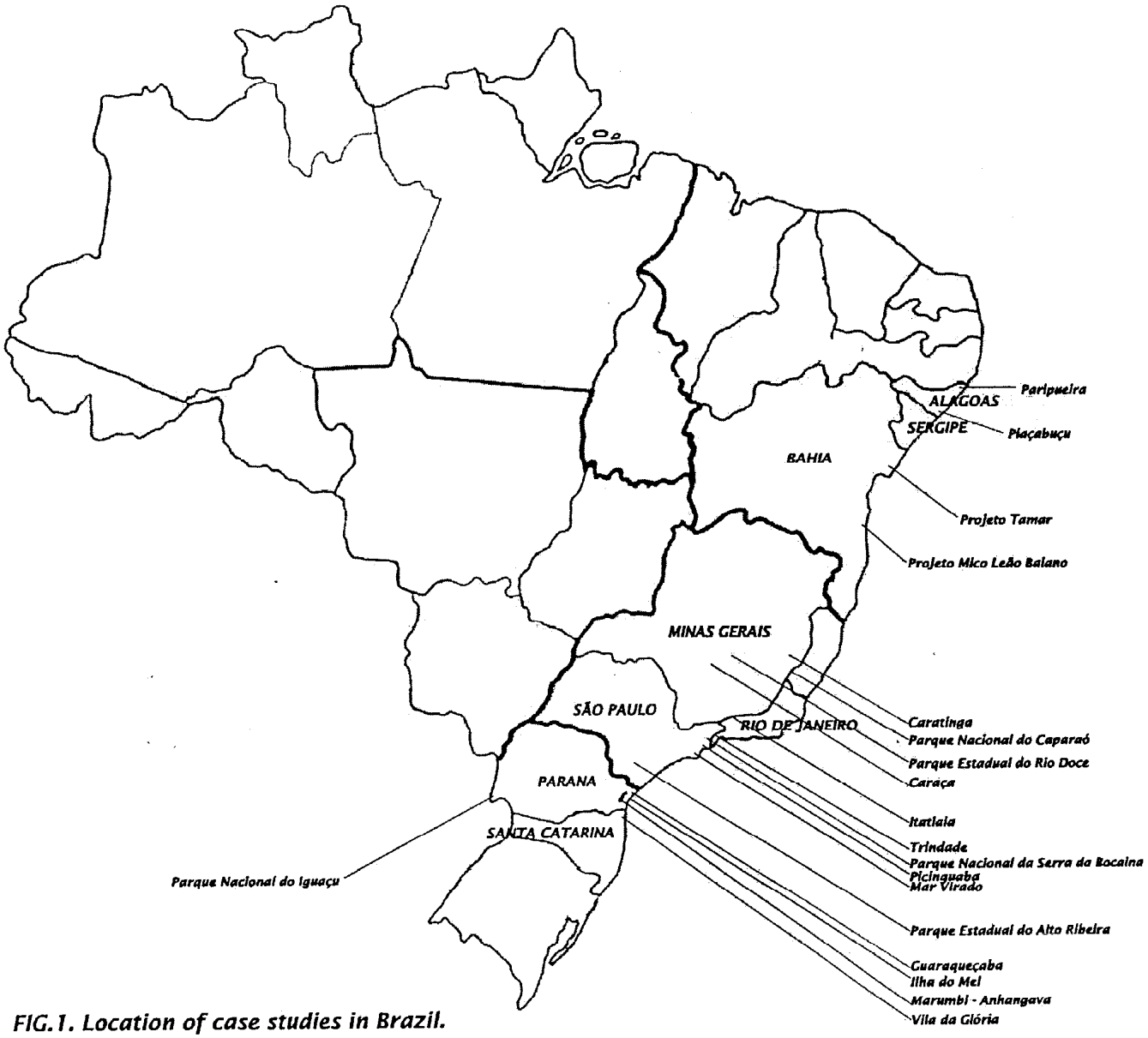

FIG.1. Location of case studies in Brazil.