ANALYSIS

Ecotourism and economic incentives — an empirical approach

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Abstract

Within the new array of ‘green’ products and services, ecotourism claims to combine environmental responsibility with the generation of local economic benefits that will have both a development impact and serve as conservation incentives. Economic incentives are imperative for nature conservation, particularly in remote and ill-monitored regions where a weak presence of the state hinders the use of alternative tools of environmental regulation. In the following, the link between tourism, local benefits and conservation is conceptualised and analysed empirically, using data from the Cuyabeno Wildlife Reserve in the Ecuadorian Amazon region, near the border of Colombia and Peru. Three Cuyabeno indigenous groups have developed different modes of tourism participation, ranging from autonomous operations to pure salary employment. A quantification of local cash flows from tourism allows for a comparative analysis of income structure, spending, and the impacts on local development and on conservation attitudes. It is concluded that in the whole study area, tourism has actually provided significant additional income. Counter to common belief, the mode of participation is less decisive for local income generation than the tourist attraction of the natural site, the degree of tourism specialisation and the level of local organisation. However, as a conservation incentive, the effectiveness of tourism income depends on the incentive structure inherent in the mode of participation, and on the substitution versus complementarity of other productive activities: only if tourism changes labour and land allocation decisions, will it have a local conservation impact. It is discussed under which circumstances the conjectured link between tourism, local incomes and conservation is likely to be effective. This leads to some general lessons for government policies, for the design of integrated conservation and development projects (ICDPs), and to a number of site-specific recommendations for improving incentive structures. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

1.1. The conceptual framework

For developing countries, a rapidly growing tourism industry has proved to be an increasingly important source of foreign exchange inflows. Nature tourism, a particularly dynamic sub-sector, is an important tool for generating employment and income in underdeveloped, biodiversity-rich Third World regions because it requires comparatively small investments. Conservationists also look to nature tourism as a potential ‘win-win’ strategy of sustainable development, where tourist spending constitutes a much-needed instrument for capitalising on biodiversity and natural sites.

For nature tourism to be sustainable — and thus acceptable to both developmentalists, conservationists and environmentally conscious tourists — a number of environmental, economic and social requirements have to be fulfilled. This has led to the introduction of ‘ecotourism’, as a nature tourism eco-label. Definitions focus on ‘environmentally responsible’ tourism (Ceballos-Lascurain, 1993) that provides ‘direct benefits’ to the nature conservation area and to ‘the economic welfare of local residents’ (Ziffer, 1989), or a ‘nature tourism that promotes conservation and sustainable development’ (Boo, 1992). The criteria for ecotourism employed in the literature may be summarised as follows:

1. Minimal physical and social impacts on the visited area
2. Ecological education of the tourist at the natural site
3. Notable economic participation by local residents

The following analysis will focus on the last criterion, i.e. local economic participation. It aims both at an equal distribution of tourism incomes and at a maximisation of local development potentials by reducing import leakages (Cater, 1994, p. 3). Furthermore, high local income should also increase conservation incentives, inter alia, because local resource managers have the most direct bearing on the environment, whereas tourism agencies are geographically more mobile: they may more easily ‘move-on’ from a degraded site to a pristine area. Local tourism income is thus both a goal in itself, and an instrument for conservation.

In conceptual terms, the linkages between local tourism participation and conservation have not been properly discussed in the ecotourism literature. To make hidden premises more explicit, the supposed causality can be divided into different stages, as illustrated in Fig. 1.

First, it is often assumed that a more autonomous tourism operation creates larger local economic benefits than when local groups are dependent on external tour operators that assume a ‘paternalistic’ role (Cater, 1994, p. 7; Colvin 1996, p. 32). Local residents’ weak bargaining position in a salary relation with operators would

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1 This work originates from the author’s 1993–96 assignment to the IUCN Forest Conservation Programme in Quito, Ecuador. A comprehensive research report in Spanish was published in June, 1996 (Wunder, 1996).
keep them in static dependency and unequal benefit sharing, where agencies are able to reap the bulk of profits. Operation permanence is also thought to be less efficient without local control. This can be translated into a working hypothesis:

Hypothesis 1: The implementation of autonomous tourism operation triggers larger local income than ‘paternalistic’ models of dependency towards external tour operators.

Reading Fig. 1 stage-wise, additional income causes socioeconomic changes and development impacts at the local level, in terms of substitution in production and consumption patterns, changes in income distribution, cultural and gender-related modifications, etc. The nature of these changes will also be decisive for conservation incentives. For example, if deforestation from cattle ranching is currently the main environmental threat, but cattle ranchers do not participate in tourism income, conservation incentives are bound to be inefficient. In other words, local resource managers need to have a stake in conservation, which tourism income can help to provide.

Three types of conservation impacts are distinguished in Fig. 1. First, unsustainable local management practices (e.g. over-hunting, over-fishing) may be reformed or reduced. Second, certain non-traditional, degrading activities may be entirely abandoned (such as forest clearing for cattle ranching). In both cases, the impact of tourism incomes may work through both new pull factors (biodiversity as an income-generating asset to be conserved) and reduced push factors of degradation (reduced poverty may allow resource managers to adopt a more long-term sustainability vision). Finally, tourism income also motivates and strengthens local residents in struggling against environmental threats from external agents (e.g. loggers, squatters, miners); local residents are empowered in their key position as environmental guardians.

Each of the three types of ecotourism-induced incentives can make a positive contribution to nature conservation. This can be formulated as a second working hypothesis.

Hypothesis 2: Local tourism income provides a powerful incentive for conservation, by making traditional resource management more sustainable, by substituting degrading activities, and by increasing local protection capacity against external threats.

1.2. Evidence on local ecotourism income

In general, only few quantitative studies on extent and impact of local tourism income in the Third World exist. Much of the ecotourism literature has dealt extensively with the environmental impacts of tourism (e.g. Stankey et al., 1985; Ziffer, 1989; Whelan, 1991; Boo, 1992), but the economic dimension has received less attention. When economic aspects are treated, it is mostly without quantification that would allow for a proper test of the hypotheses (e.g. Healy, 1988; Laarman and Durst 1991; Healy, 1992). On the other hand, some quantification (e.g. Tobias and Mendelsohn, 1991) employ the travel cost method that aims at measuring consumer welfare gains, rather than the direct financial flows.

General cash flow estimates exist, for example, for the CAMPFIRE project in Zimbabwe, a pioneer experience of community-based wildlife management for safari tourism and sport hunting that generates yearly revenues of up to 4000 USD per household (The Zimbabwe Trust et al., 1994). In other African countries, cash flow analysis has also been used to calculate tourism-derived wildlife values from key income-generating assets (e.g. elephants or lions), and the corresponding per hectare value of their protected habitats (see Dixon and Sherman, 1990 for a resumé). In Asia, an ecotourism showcase is the Annapurna Conservation Area Project (ACAP) in Nepal. Trekking fees have allowed for a basically self-sustained financing of integrated conservation and development activities, to the benefit of the local population (Gurung and Coursey, 1994).

Turning to Latin America, Groom et al. (1991) found that for the Madre de Dios region in Peru tourism benefits depend heavily on the type of destination: ‘backpacker’ areas, with
easy access and an already intervened natural environment, generate ten times less income than the virgin, but remote, Manu Biosphere rainforest reserve that caters to wealthier tourists. However, in terms of local income generation, this difference is partially offset by the higher local share (25%) in backpacker expenditure compared to upmarket tourist spending (11%).

Similar results are obtained by Drumm (1991) for the Ecuadorian Amazon region: in spite of much higher tourism spending on tours in exclusive and pristine destinations, local income is found slightly higher in backpacker destinations. This is due to luxury spending by upmarket tourists who rely more on imports from outside the region, whereas backpacker demand can more easily be satisfied by local production factors (food, guides, transport, etc.). In other words, primitive tourism has a higher local multiplier and backward linkage effect than the upmarket version.

Probably the most comprehensive work on ecotourism economics in developing countries is the Belize protected area study by Lindberg and Enríquez (1994). It concludes that communities have generally profited significantly from tourism directed towards adjacent protected areas by selling handicrafts, providing accommodation and other services — though without making an explicit comparison with non-tourism incomes. Besides local inflation effects created by the tourism-derived competitive demand for local resources (rising prices for labour, food, land), impacts are generally positive, including a gradually more equitable distribution of tourism income among village households. On aggregate, the results also clearly confirm that tourism has increased the local communities’ support of Belize’s system of protected areas.

2. Tourism and environmental pressures in Cuyabeno

The Cuyabeno Wildlife Reserve, a biodiversity-rich area in Ecuador’s Northern Amazon region, was created as a protected area in 1979, responding to the continuous pressures from loggers, oil-palm plantation farmers and especially colonos (squatters). The latter, mostly of mestizo origin from the densely populated Ecuadorian highlands, are encroaching on new lands for commercial agriculture and cattle ranching. However, some indigenous groups, such as Quichuas and Shuar, have also recently migrated to Cuyabeno from population surplus areas in the Amazon basin or the Andean flanks. Sionas and Secoyas arrived from Peru and Colombia about half a century ago; the Cofans from Zábalo migrated from a nearby area. In other words, the ‘natives’ versus ‘colonos’ distinction is continuous rather than dichotomous in Cuyabeno.

Gradual land occupation in the Northern Amazon region of Ecuador was eminently assisted by the construction of oil roads. Throughout the last two decades, the share of Amazon oil in total Ecuadorian exports has fluctuated between 35 and 65% (World Bank, 1992), so there is a powerful economic argument for continuous exploration and drilling. At the same time, this is a main environmental threat in terms of deforestation, water pollution, and indirect impacts.

The pioneer tourist agencies Nuevo Mundo and Etnotur have arranged trips to Cuyabeno since the beginning of the 1980s. Quite successful operations were established around the Cuyabeno lakes, an area in the western part of the Reserve, easily accessible by boat and rich in wildlife (see Map). According to the records of the park agency INEFAN, the number of visitors to Cuyabeno reached 4879 in 1991, and the number of agencies operating in the Cuyabeno lakes has now risen from the original two to 14–20 (all Cuyabeno agencies are Ecuadorian-owned). However, since 1991, visitor numbers have levelled off, and even decreased during the 1995 war with neighbouring Peru. This indicates that tourism expansion may have reached a level of saturation.
While all tourism in Cuyabeno is obviously nature-oriented, one can discuss whether the criteria for ‘ecotourism’ are generally met. At least, the larger agencies have subscribed to the principles of ecotourism, using trained guides, minimising visitors’ environmental and cultural impact, adding educational components, etc. However, several small operators undercut prices and act as ‘free riders’ on the ecotourism wave, e.g. by hunting animals for food and waste-polluting the area. INEFAN, the understaffed state agency for protected area management, has proved unable to control the access and impacts of unauthorised tour operators.

Cuyabeno has several advantages as a case study area for ecotourism and local economic participation. First, the 1991 enlargement of the reserve to more than double its original size (about 400,000 ha) was a direct result of the lobbying by the tourism sector. Especially the Transturi Company had a pronounced interest in securing the natural integrity of the area. It had recently moved its 48-passenger floating river hotel ‘Flotel Orel- lana’ from the now degraded Limoncocha area to the pristine Aguarico River in Cuyabeno.

Second, the different indigenous groups living in the Reserve have developed different modes of cooperation with tourism agencies. This allows for a comparative analysis. The Quichuas of Zancudo and Playas de Cuyabeno are working on a salary basis in Transturi’s large-scale, upmarket Flotel operation; the Siona–Secoyas of Puerto Bolívar and San Pablo are semi-autonomous providers of canoe and accommodation services. The Cofans of Zábalo show the highest degree of autonomy by independently operating all local services, but working in joint venture with Transturi in terms of marketing and transport logistics.

Third, the history of tourism development in Cuyabeno is basically shaped by the private sector, rather than by aid agencies and integrated conservation and development projects (ICDPs). For analytical purposes, this means that the generation of tourism income has not been subject to the rentability bias typically introduced by ample financial subsidies and technical assistance.

Oil, logging, unsustainable tourism and squatters are the main environmental threats to Cuyabeno, all of which are external. Yet the site-specific internal pressures by indigenous residents, in terms of over-hunting and deforestation for cash crops and cattle ranching, should not be neglected. The productive models of the various ethnicities in Cuyabeno vary: remote villages like Zábaló (Cofans) and Zancudo (Quichuas) maintain their traditional lifestyle as hunters and gatherers, supplemented by small-scale subsistence agriculture. In part, this is also true for Puerto Bolivar (Sionas), where only a few families have gone into medium-scale cattle ranching. The situation is different for the Secoyas in San Pablo and the Quichuas in Playas. San Pablo, located on the western border of the Reserve, only 1.5 h from the road in Chiritza, has suffered significant pressure from squatters, oil companies and palm plantations, so that nearby natural areas are too degraded for an attractive tourism operation. Market access is relatively easy, so the Secoyas supplement their subsistence crops with sales of coffee, cocoa, cattle and, occasionally, timber.

Market orientation also prevails in Playas, where cattle ranching occupies a dominant position (certain families hold up to 40 head of cattle). In spite of the indigenous ethnicity, the productive model here resembles the mestizo type of squatter colonisation. Cattle ranching is a clear motive for deforestation, especially because good market access has attracted migrants and kept the local population surplus inside the area: over the last ten years, the number of families in Playas has more than tripled (from 15 to 52). Obviously, population growth causes a derived demand for food crops which creates additional deforestation. Unlike Zábalo and Puerto Bolivar, the community of Playas has not been able to elaborate an agreement with the national park authorities to legalise their settlement inside the reserve.²

Environmental stress in Puerto Bolivar, Zábalo and Zancudo is less severe, but over-hunting occurs: as game and fish constitute the main protein source, a high per-capita game consumption is observed. Without judging the sustainability of

² Within the Ecuadorian protected area system, human settlement inside a Wildlife Reserve may be legalised if only ‘traditional’ activities are carried out that are supposed to be compatible with conservation objectives.
hunting in Cuyabeno, an indiscriminate way of practising traditional techniques is bound to be incompatible with ecotourism based on wildlife observation.3

3. Models of local tourism participation

If we define the term ‘local’ as residents of the Cuyabeno Reserve4, and ‘tourism participation’ as the ability of residents to influence the operation and its outcomes, we observe that tourism participation models vary widely across ethnicities in Cuyabeno. The Quichuas of Zancudo and Playas are working on a salary basis with Transturi, the largest of the agencies operating in Cuyabeno. In Zancudo, seven people are working permanently with Transturi, while eight are employed as day labourers; in Playas, the figures are 12 and two, respectively. Together with derived incomes, such as tourist tips (both pooled and personal), this provides the main source of local tourism income. However, not only cash flows from tourism matter. Zancudo, the small and isolated Quichua community near the Peruvian border, signed in 1994 a Letter of Agreement with Transturi (see Table 1) that ensures an in-kind transfer of goods (school uniforms, foodstuff) and access to services (transport, medical and educational assistance). In return, the community ensures Transturi exclusive access to the area and abstains from hunting in tourism-designated areas, compensated by a monthly Transturi gift of one head of cattle.

The agreement resembles closely what in the literature is contemptibly designated as a ‘paternalistic’ tourism operation: local communities receive handouts from a metropolitan profit-maximising company, are restricted in their traditional lifestyle, and have basically no say about the mode of tourism operation. Nevertheless, it is noteworthy that Zancudo residents in our field interviews expressed satisfaction with the mode of operation, given that a paternalistic cooperation also meets specific Zancudo community needs of more broadly defined assistance; in fact, Transturi took over this role from the Ecuadorian military. Rather, disagreements arose about the size of benefits — financial crisis in Transturi has lately reduced both local employment and cash transfers.

At the other end of the continuum of self-determination, the Cofans from Dureno moved 13 years ago to the Zábaló area to establish their own specialised tourism operation, at the same time preserving traditional Cofan lifestyles that had come under increasing environmental pressure in Dureno. Operation experiences had been gathered during the 1970s by organising back-packer tours to the Aguarico area. From 1984 onwards, Zábaló attracted mainly US tourists through contacts with the US-based agency Wilderness Travel. During recent years, the community has formed the Aguarico Trekking joint

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3 Residents generally indicated in the interviews that certain mammals had become more and more scarce over time in the vicinity of the villages. This can only be sustainable in areas of low-density population with periodic migration — a situation that may no longer apply to Cuyabeno.

4 Mestizos from Quito and from neighbouring towns like Lago Agrio are also employed in Cuyabeno tourism operations, but are not permanent residents and do not have impact on local environmental management.

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<table>
<thead>
<tr>
<th>Transturi obligations</th>
<th>Zancudo obligations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide local employment</td>
<td>Protect natural resources against external intruders</td>
</tr>
<tr>
<td>Grant 1 head of cattle/month</td>
<td>Abstain from hunting and other degradation activities in the area of tourism operation</td>
</tr>
<tr>
<td>Grant different food items</td>
<td>Generally facilitate the tourism operation and provide access to the area</td>
</tr>
<tr>
<td>Offer medical services</td>
<td></td>
</tr>
<tr>
<td>Offer river transport</td>
<td></td>
</tr>
<tr>
<td>Offer occasional air transport</td>
<td></td>
</tr>
<tr>
<td>Provide school uniforms etc.</td>
<td></td>
</tr>
<tr>
<td>Pay school teacher salary</td>
<td></td>
</tr>
<tr>
<td>Offer local education courses</td>
<td></td>
</tr>
</tbody>
</table>

* Source: Cemecotur/Transturi (1994).
venture with Transturi. This implies that Transturi handles all transport logistics and the external marketing of this specialised upmarket product — 9–10 days of jungle treks with Cofan guides for 2300 USD. Zábalo concentrates on local operations where the community has a clear comparative advantage: guides, cooks, boatmen, etc. all come from Zábalo, and the construction and maintenance of trails and camps are also local responsibilities. Net profits from the joint venture are shared equally between Transturi and the Cofans. A special factor of success in Zábalo has been the community leader, Randall Borman, with his knowledge of both indigenous and Western cultures. He is instrumental in both local organisation (tourist demand for reliability, punctuality and planning) and, with his commercial contacts in the US, for marketing the tour. Another distinctive feature in Zábalo is the accumulation of tourism experience over 20 years, providing time-consuming learning-by-doing processes.

Zábalo’s innovative joint venture organisation has already been described in the literature (Buglass, 1995). However, the community also benefits from a more traditional cooperation: twice-a-week, tourists from the Transturi Flotel visit the Zábalo Museum (with traditional Cofan artifacts), go for a guided jungle walk (Transturi pays 2 USD per tourist for these two components), and Zábalo handicrafts are sold. Because of the large number of Flotel tourists, the Zábalo Museum is located outside the village, in order to avoid detrimental cultural impacts from mass visits.

Finally, the Sionas–Secoyas, two ethnicities in the Cuyabeno lakes area that have mixed increasingly over time, operate an intermediate model of partial autonomy: motorised canoe transport and simple hut accommodation is offered and controlled by individual Sionas and Secoyas, but salary labour is also contracted by the agencies that remain in charge of the overall operation management. Simultaneously, incipient local efforts exist to market operations that are completely independent of the agencies. The Sionas of Puerto Bolivar have gained monopoly rights on river transport in the Cuyabeno lake area, which, with the increasing agency crowding, is a lucrative business. In fact, agencies have promoted local ownership of boats and motors by providing cheap credits, in order to avoid poor maintenance thefts of gasoline and company-owned equipment. However, some agencies complain that the Sionas are incapable of providing reliable river transport services on an extended scale, rendering the transport monopoly an inefficient arrangement.

Courses have been arranged by the GTZ-financed PROFORS project for native tourist guides in Puerto Bolivar, sustaining a source of additional income, e.g. compared to Transturi that does not employ native guides. However, the quality of native guides is believed to be superior in the autonomous Zábalo operation. Ordinary salary employment (cooks, assistants) is also provided by the agencies, although some bring in their own, non-native employees.

In addition to boat and hut operation, the Secoyas of San Pablo have signed a Letter of Agreement with the agency Etnotur that includes ‘paternalistic’ elements, similar to the Zancudo-Transturi agreement (transport, medical services, donations for local festivals, etc.). Some cultural services (demonstration of dances, hunting techniques) are also part of the Etnotur package and generate local incomes. Both Sionas and Secoyas have made nascent efforts to promote entirely independent tourism operations. These range from the construction of new tourist huts to the opening of a Siona tourist contact point in the provincial town of Lago Agrio. Until now, these efforts of reaching total autonomy have not been successful. On the one hand, native residents tend to underestimate the problems (and the investment requirements) related to the logistics and marketing of tourism; on the other hand, the stagnation of overall visitor figures and the entry of unauthorised agencies has increased competition in Cuyabeno. This indicates a growing trend toward idle capacity and over-investment in Cuyabeno hut accommodation.
Table 2
Comparing local tourism incomes in Cuyabeno yearly figures, in USD**

<table>
<thead>
<tr>
<th>Item</th>
<th>Zancudo</th>
<th>Playas</th>
<th>Zábal</th>
<th>San Pablo</th>
<th>Puerto Bolivar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associates’ profits</td>
<td>–</td>
<td>–</td>
<td>15 254 (30.9%)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Salary assistants</td>
<td>18 891 (58.6%)</td>
<td>25 570 (78.5%)</td>
<td>5492 (11.1%)</td>
<td>2115 (14.6%)</td>
<td>3966 (20.3%)</td>
</tr>
<tr>
<td>Salary native guides</td>
<td>–</td>
<td>–</td>
<td>1831 (3.7%)</td>
<td>1410 (9.7%)</td>
<td>2125 (10.9%)</td>
</tr>
<tr>
<td>Canoe transport c</td>
<td>–</td>
<td>–</td>
<td>336 (0.7%)</td>
<td>3922 (27.1%)</td>
<td>8969 (46.0%)</td>
</tr>
<tr>
<td>Tips</td>
<td>5980 (18.6%)</td>
<td>5695 (17.5%)</td>
<td>3569 (7.2%)</td>
<td>3525 (24.3%)</td>
<td>2087 (10.7%)</td>
</tr>
<tr>
<td>Handicrafts</td>
<td>–</td>
<td>–</td>
<td>17 096 (34.6%)</td>
<td>176 (1.2%)</td>
<td>1051 (5.4%)</td>
</tr>
<tr>
<td>Lodging huts</td>
<td>–</td>
<td>–</td>
<td>Incl. a</td>
<td>–</td>
<td>522 (2.7%)</td>
</tr>
<tr>
<td>Food sales</td>
<td>244 (0.8%)</td>
<td>488 (1.5%)</td>
<td>732 (1.5%)</td>
<td>220 (1.5%)</td>
<td>788 (4.0%)</td>
</tr>
<tr>
<td>Other items</td>
<td>–</td>
<td>–</td>
<td>5120 (10.4%)</td>
<td>925 (6.4%)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total tour incomes</strong></td>
<td>25 115 (77.9%)</td>
<td>31 753 (97.5%)</td>
<td>49 430 (100%)</td>
<td>2293 (84.8%)</td>
<td>19 508 (100%)</td>
</tr>
<tr>
<td>Services by agreement</td>
<td>7118 (22.1%)</td>
<td>813 (2.5%)</td>
<td>–</td>
<td>2205 (15.2%)</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total tourism income</strong></td>
<td>32 233 (100%)</td>
<td>32 566 (100%)</td>
<td>49 430 (100%)</td>
<td>14 498 (100%)</td>
<td>19 508 (100%)</td>
</tr>
<tr>
<td>Inhabitants # per capita income h</td>
<td>80</td>
<td>175</td>
<td>100</td>
<td>150</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>403</td>
<td>184</td>
<td>494</td>
<td>97</td>
<td>139</td>
</tr>
<tr>
<td><strong>% Tourism of cash income</strong></td>
<td>95%</td>
<td>25–35%</td>
<td>100%</td>
<td>15–25%</td>
<td>40–45% [80–90%] b</td>
</tr>
</tbody>
</table>

** Notes: **

1 USD = S/.2950 in January 1996.
2 Only incomes from Nuevo Mundo and Neotropic agencies, total incomes are likely to be around double.
3 Net income only (salary, motor maintenance) — labour cost 45%; gasoline, oils 40% and depreciation 15% are excluded.
4 Remuneration included in the tour price.
5 Payment of 2 USD for each Flotel passenger who visits the Zábal museum.
6 Includes cultural services and a 5 USD payment for each tourist who arrives in the community.
7 Calculated as total tourism income/inhabitants.
8 Calculated as total tourism income/total village income (the latter estimated approximately).

4. Quantification of local monetary benefits

The data presented below originates from semi-structured interviews in Cuyabeno villages, and a rapid appraisal of the socioeconomic framework and of local tourism participation. This was supplemented by in situ observation of Cuyabeno tour operations, a short tourist questionnaire, and interviews of selected operators and other stakeholders in Quito. In methodological terms, we defined local benefits as related only to indigenous residents (see above), with emphasis on cash flows. We are interested in current yearly income (rather than past or seasonally confined benefits) and in the net returns to local production factors (i.e. deducting costs of gasoline, imported food and other inputs from outside the Reserve).

First, the structure of tourism income, as indicated by the percentage shares, illustrates the different participation models: assistant wage categories dominate in Zancudo and Playas; boat transport is most important in Puerto Bolivar and San Pablo; corporate profits prevail in Zábal. Note that derived sales, such as handicrafts and food, have a very limited role — except for Zábal, where handicraft sales are the single most important income source. The monetary value computed for free services (multiplying corresponding market values by the likely frequency of
use) has importance for the ‘paternalistic’ cases of Zancudo and San Pablo.

Total income figures in Table 2 (in current USD) are much higher than previous rough estimates by Ceballos-Lascuráin (1993, pp. 53–58) and BMZ (1995a,b): Zábalo: 49 430 USD (Ceballos: 20 000–30 000 USD), Playas and Zancudo together about 65 000 USD (Ceballos: 35 000 USD) and a range of 19 500–40 000 USD for Puerto Bolívar (Ceballos: 15 000–20 000 USD). This shows that only by conducting a full, explicit analysis of all benefits can severe under-estimations be avoided. The income totals in the five investigated sites vary from 15 000 to 50 000 USD/year. However, per capita income and the tourism share in total cash income (the two bottom lines in Table 2) may give a better indication of the relative importance that tourism plays in the local economy.

The figures do not categorically rule out a link between autonomy and higher incomes: the salary model of Zancudo produces, with about 400 USD per capita, about 20% less income than the self-management model of Zábalo. However, the intermediate model of Puerto Bolívar yields an income total that probably is not much inferior, given that our assessment here did not cover all the agencies at this site. Factors beyond the question of autonomy seem to be more important for income differences: the much larger gap to the two remaining sites (San Pablo, Playas) are rather due to a lower degree of specialisation in tourism. Zancudo, Zábalo and Puerto Bolívar (all with tourism income shares above 80%) have sufficiently attractive natural sites at their disposal to make tourism a way of living. In turn, Playas and San Pablo practice a model of cash crop and cattle-oriented production in already intervened areas, and have found a niche in the tourism business to complement their cash crop and cattle incomes.

However, even in Playas and San Pablo, tourism is a very competitive source of income generation. Local day labour rates (jornales) accorded for occasional labour exchange are good indicators for the remuneration from alternative employment opportunities. In Playas, the wage for permanent employment at the Flotel (6.5 USD/day; 1 USD = 2950 sucres in January 1995) is about double the rate of the local jornal (3.4 USD). In San Pablo, the local jornal is between 1.7 and 2.7 USD, compared with tourism rates for assistants (3.4 USD), nature guides (6.8 USD) and self-employed boatmen (22.9 USD). Obviously, for Zancudo and Zábalo, the corresponding argument is even more clear-cut: the de facto absence of other local cash-generating activities leaves only one alternative for monetary income generation: temporary migration. For Puerto Bolívar, only a few families receive competitive cattle-based incomes: the majority of cash flow (80–90%) comes from tourism.

5. Socioeconomic impacts

As discussed in Section 1, the local impact of tourism is not simply proportional to the size of income, but depends on the locally induced processes of change, e.g. a shift towards cash economy, seasonal income fluctuations, local investment possibilities, etc. One important intermediate factor is income distribution. It must be expected that tourism income is not all equally distributed from the start, as individuals have different preconditions, motivations and energy to respond to this new option. Yet in our cases,

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6 The 19 508 USD/year for Puerto Bolívar in Table 2 concerns only incomes from the two most important out of 14–20 agencies operating on the Cuyabeno lakes. It proved impossible to investigate all agencies, but by multiplying average transport costs/tourist with the number of tourists entering the lakes, it seems likely that another 20 000 USD are generated; i.e. net tourism income in Puerto Bolívar would be around 40 000 USD (figure given in squared brackets in Table 2).

7 One might object that dollar inflation and increasing demand impedes comparison with earlier studies, but as overall tourist inflow has declined since 1991, real income figures are in fact likely to have been higher in previous years.

8 However, in later stages, processes of diffusion may foment equity. In the literature on development and inequality, this temporal adjustment is known as Kuznets’ inverted U-curve. For the specific case of tourism and communities in Belize, this pattern was confirmed by the study of Lindberg and Enríquez (1994). It would need further exploration to determine if the same type of adjustment can be expected to function in the Ecuadorian case.
different equalising mechanisms are also at work. In Zábalo, only half of the families participate in the Aguarico Trekking joint venture and in its profits, but the others get their share of the tourism pie from employment during treks and the significant sales of handicrafts. In San Pablo, a communal job rotation scheme ensures income spread. In Zancudo and Playas, wage employment embraces many families, although the large difference in Transturi’s pay rates between fixed and transitory workers creates some jealousy. However, in Puerto Bolívar, the income from the boat transport monopoly is highly concentrated in the hands of two dominant families, which causes certain social frictions.

Tourism-induced local inflation impacts (on land, labour and foodstuff prices) are observed by Lindberg and Enríquez (1994, p. 70) as negative side effects in Belize. In the Cuyabeno Reserve, private land ownership and sales are prohibited, and tourism currently does not cause competing demand for local goods such as food. Yet the higher tendency to buy and sell labour (replacing ancient modes of hand exchange) raises wages. This may indicate local inflation impacts, but these are inevitably related to higher income and new divisions of labour time. Wage increases can only make up a social problem when tourism income is unequally distributed (see above).

For what has tourism income been used? Our field survey indicates some rough trends. In remote villages (Zancudo, Zábalo), current consumption has remained unaltered, whereas good market access (San Pablo, Playas, Puerto Bolívar) has stimulated increased purchases of rice, sugar and alcohol. Generally, more money is spent on consumer durables, mainly outboard motors (that increase mobility and are symbols of social status), radios, solar cells, etc. Part of the money was also saved or invested in children’s urban education.

In the social and cultural sphere, most tourism impacts were locally perceived as positive, e.g. the ‘ethno-tourist’ components in Zábalo and San Pablo that revalue traditions and constitute a cultural exchange. However, in Puerto Bolívar, the high number of tourists and the sudden ease of income have caused cultural erosion (‘Western-isation’ and cultural repercussions from Ecuadorian criollos and in-migrant Quichuas on native language and habits), increased alcohol consumption, disease risks, etc. In gender terms, mostly men are employed in tourism, which may leave women with greater responsibilities and work in domestic domains. Many of these changes produce lasting impacts: even if tourism would decline to zero over the next decade, it is unlikely that cultural changes would revert accordingly.

6. Environmental impacts

In the literature about environmental tourism impacts in Cuyabeno, some authors underline current damages and risks (Paz y Miño, 1990; Calvopiña and Calvopiña, 1993) and the need for halting expansion by intervention (Ceballos-Lascuráin, 1991), with reference to the ‘limits of acceptable change’ (Stankey et al., 1985). Others (Ulloa, 1994) have demonstrated the negligible impact of selective operations and conclude that with good planning, no tourism freeze is needed (BMZ, 1995a,b, p. 295). Rather than all environmental impacts, the evaluation here concerns those induced specifically by tourism income incentives to raise sustainability in traditional techniques, to reduce non-traditional degradation, and to improve safeguards against external threats (see Section 1). Although no precise measures of changes in conservation levels exist, some mechanisms of adjustment can be outlined.

A good example of improved management in traditional activities is the case of Zábalo. Residents acknowledged that over-hunting of certain mammals near the village previously was a threat not only to the traditional resource base, but also to tourism, as it became increasingly difficult to observe many species. Hence, a communal zoning scheme was adopted, prohibiting all hunting in the tourism zone. Additionally, the most threatened species were completely protected, while for others, a monthly hunting quota was set for each family. Violaters of these rules are subject to communal fines. Surprisingly, this has not triggered a dramatic decline in overall game consumption, but rather a shift in species consumed...
and reduced waste. In other words, the fact that biodiversity became an income-generating asset induced a new self-imposed rationality in natural resource management. Apparently, this has implied that certain mammals and birds which had become extremely scarce can now be observed by residents (and tourists) with greater frequency (R. Borman, personal communication, 1995).

In Zábalo, good community organisation and clear conservation incentives produced targeted restrictions on over-hunting; in Puerto Bolívar, the Sionas also adopted a participatory zoning scheme, but with external help (and motivation) from PROFORS and INEFAN. Hunting prohibitions in the Cuyabeno lake area now seem to be respected, but logs are still extracted by the Sionas, making this at least a partial success (A. Müllner, A. Pfrommer, personal communication, 1995). In Zancudo, with a pure salary model, there is no clear incentive for sticking to the Transturi-imposed and ill-monitored hunting restrictions. This has rendered the company’s ‘protein substitution’ schemes a failure. Yet even in Zancudo, some reduction in hunting has occurred, but rather than income-led, this was a result of the reduced labour time available: many men working in tourism, in Zancudo and elsewhere, now lack the time to go hunting for 10–15 days; this element in their traditional lifestyle has been lost through tourism labour demands.

In terms of non-traditional activities, such as cattle ranching and cash crops produced in San Pablo and Playas, tourism has had a very limited role to play. The previous intervention and natural degradation gave these villages little comparative advantage in attracting local ecotourism operations. Tourism income in Playas comes from Transturi wage employment on the Flotel; in San Pablo, the natural tour sites are in distant Lagartococha, so that they are geographically detached from the villages. In both places, tourism income shares are minor, and there is no incentive for abandoning commercial, non-traditional local activities. A conclusion on local conservation is that tourism income influences local resource use, but jointly with other explanatory factors, including demographic pressure, distance to markets, degradation by external actors, level of community organisation, and ethnic, historical and cultural differences among villages.

Finally, the most important external threat to the integrity of Cuyabeno is oil exploitation that ‘opens up’ the area for squatters and other derived impacts. As mentioned, the lobbying of tourism interests was crucial in the 1991 enlargement of the reserve. Recently, the ‘Association for the Defence of Cuyabeno’ (a heterogenous mix of indigenous groups, tour operators and environmentalists) has achieved a Presidential Decree that prohibits oil-related activities in the Imuya zone — perhaps the area with the highest biological diversity in Cuyabeno. It is too early to tell whether this alliance can resist the powerful oil interests in the long run, but its lobbying results hitherto have been remarkable.

7. Conclusion

Two hypotheses were formulated in the first section of this paper regarding the link between tourism participation models and local income (hypothesis 1) and between income incentives and conservation (hypothesis 2). The supposed exploitative character of salary-based, ‘paternalistic’ models, compared to autonomy models, could not be confirmed by our results.10

Conclusion 1: In all five study cases, local residents receive significant benefits that out-compete other income sources. Income disparities between villages are better explained by different degrees of tourism specialisation than by a varying degree of autonomy from tourist agencies.

Our results do not lend support to those (NGOs, tourism analysts, etc.) who assume that

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9 In addition to the monthly cattle transfer, Transturi also tried to introduce sheep in Zancudo as an alternative protein source; however, Zancudo residents, instead of breeding, simply consumed the stock (R. Garcia, personal communication, 1995).

10 Note that this conclusion does not refer to the ‘vertical’ distribution of tourism incomes, i.e. profit sharing between agency and community, which we are not trying to elucidate here.
autonomously operating communities would clearly be better off than salary-receiving ones. The somewhat naïve belief about ‘easy money’ from tourism marketing and the romantic vision of indigenous autonomy are not justified and may lead to excessive community expectations and mislead investments. It is also noteworthy that the implementation of autonomous models depends on e.g. local capacity, community organisation and an ‘entrepreneurial spirit’ — the willingness to invest productive inputs, take risks and accept income fluctuations. These pre-conditions are seldom met simultaneously. Rather than creating fully indigenous-led tours, specific local tasks may be transferred step-by-step to local management.

Regarding the second hypothesis, there is no doubt that tourism has contributed significantly to the conservation of the Cuyabeno Reserve. More specifically, each of the three channels of impact from Section 1 can be evaluated:

**Conclusion 2:** (1) in villages specialised in tourism, income flows raised environmental awareness and gave incentives for a new rationality in traditional resource use; (2) tourism income is less likely to reverse non-traditional, degrading development patterns in advanced stages; (3) tourism income can help to unite actors and strengthen the raison d’être of a protected area threatened by competing land uses.

Note that conservation incentives tend to vanish when tourism income is geographically detached from the village’s area of land use, because biodiversity extinction in the backyard then does not reduce tourism incomes. Yet adjustments may occur through substitution of labour time, rather than additional income. Irreversibilities in natural degradation may make ecotourism a tool more suitable for pristine areas in early stages of commercial land-use development — at least under scenarios where many natural sites compete for a limited number of tourists. Fig. 1 with the two stage-wise hypotheses from above thus also has to be revisited, as indicated by the broken lines: past conservation levels influence both the options for choosing participation modes and, in particular, the potential for income generation.

The incentive structure matters for both the efficiency of the tourism operation and for local conservation attitudes. Thefts of gasoline and food, inadequate use of equipment, and nature-degrading practices are some of the problems encountered when incentives are lacking — e.g. in the case of the pure salary model. This means that raising local participation is an advantage to all parties, whenever local capacity is present or may be built. In the Cuyabeno case, three practical recommendations can be made. First, native guides may be an important supplement to guides from outside, if they receive the necessary training. Second, food sales can be augmented whenever this is ecologically sound and technically feasible. Third, Zábalo demonstrates that handicrafts and cultural elements have a high income potential. Changes should be gradual, allowing for mutual processes of confidence-building and learning, working with and not against commercial agencies.

8. Discussion

Obviously, the limited sample of five case studies does not allow for much quantitative testing of our two hypotheses. Also, in a remote region like Cuyabeno, even basic economic and environmental data are lacking, making it impossible to examine certain processes in greater depth. Yet, the outlines of the specific, complex processes of change induced by tourism have been described. This complexity raises some doubts about the consistency of ecotourism as a multi-dimensional concept. We recall from Section 1 the three prerequisites for the ecotourism label: tourists’ environmental education, minimisation of social and environmental impacts, and local economic participation.

The analysis of case studies points to several potential conflicts between local economic participation and the other requirements. For example, higher local food production for tourism demand may cause deforestation, or handicrafts for tourists may contain wood and feathers originating from threatened species. Also, ecotourism specialists often recommend that tourism income should not be substitutive but complementary, in order to avoid a dependency on tourism. Never-
theless, as we have seen above, conservation impacts hinge to a large extent on local substitution of productive activities and incomes.

In the social impact sphere, a certain inequality in the distribution of new tourism incomes is almost inevitable; labour time spent in tourism necessarily raises wages, certain traditional activities (e.g. long hunting trips) are reduced or abandoned, and new division of labour time fosters the introduction of monetary exchange systems and gender-related changes. Rapid and large local income growth may be socially disruptive, e.g. because of large purchases of alien consumption goods, alcohol problems, and progressive loss of cultural identity.

Many of the trade-offs sketched here may be ‘softened’ or corrected by specific fine-tuning measures, say, by avoiding the use of feathers in handicraft production, or by promoting women’s active integration into tourism activities. However, especially in the interface of social and economic factors, many changes necessarily come ‘in clusters’. Hence, it is not always possible to distinguish between ‘desirable’ and ‘undesirable’ impacts in the unambiguous manner that is suggested in the ecotourism literature.

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