

ECOTOURISM AS AN INCENTIVE TO BIODIVERSITY CONSERVATION:
THE CASE OF UAKARI LODGE, AMAZONAS, BRAZIL.
ECOTURISMO COMO INCENTIVO À CONSERVAÇÃO DA BIODIVERSIDADE:
O CASO DA POUSADA UACARI, AMAZONAS, BRASIL.

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KEY WORDS:

Ecotourism;
Conservation;
Mamirauá Reserve;
Economic incentives.

ABSTRACT

By providing economic incentives to locals who live in protected areas, ecotourism has been seen as a strategy toward conservation of biodiversity. This paper provides a long-term case-study account of the attempts to associate generation of income and conservation goals in an ecotourism enterprise in a sustainable development reserve in the Brazilian Amazon. It investigates how ecotourism represented a motivation for the conservation of the Mamirauá Lake system. Using qualitative and quantitative data, the paper shows a linkage between tourism and the preservation of the lake. In the first years of its implementation tourism provided an incentive to stop *external* threats. But in relation to internal disputes, this linkage has proved to result in ambiguous outcomes. On one hand it has been a motivation for those who benefited from tourism to try and maintain the protection status of a lake which they saw as important for tourism. On the other hand, it has been the justification of those who wanted to change total protection status of the area.

PALAVRAS-CHAVE:

Ecoturismo;
Conservação;
Reserva Mamirauá;
Incentivos econômicos.

RESUMO

O ecoturismo tem sido visto como uma estratégia de conservação da biodiversidade por gerar incentivos econômicos. Neste trabalho investigamos por meio de um estudo de caso, as tentativas de associar geração de renda e conservação em um empreendimento de ecoturismo em uma RDS na Amazônia brasileira. Usando dados qualitativos e quantitativos, o artigo mostra uma associação entre turismo e a preservação do sistema de Lagos Mamirauá. Nos primeiros anos de sua implementação, o turismo foi um incentivo aos esforços locais contra ameaças de agentes externos. Com relação às disputas internas, a associação entre turismo e preservação teve resultados ambíguos. Por um lado foi uma motivação para aqueles que se beneficiaram com turismo a manter o status de proteção total do lago, que viam como importante para a manutenção da atividade. Por outro lado, a associação foi uma das justificativas para a mudança de categoria do lago por parte daqueles que não se consideravam beneficiados com o turismo.

INTRODUCTION

“Would it be better to have distributed this amount of money among local families?” This question was proposed by a consultant hired by an international aid agency¹ to evaluate its investments in an integrated conservation and development project (ICDP) in the Amazon: the Uakari Lodge. Although the question was posed ten years ago, in other terms it remains valid. Market-oriented mechanisms, such as ecotourism, work as incentive for locals to invest in biodiversity conservation? It was not a new dilemma for conservation professionals.

During the 1990's conservation strategies were focused on projects that integrated conservation and development. This was due to a shift in conservation paradigms that had, prior to that, tried to establish protected areas devoid of human presence (BARRETO FILHO, 2002). These had high social costs, dislocating human populations the world over, without significant results in terms of its conservation goals (HUTTON; ADAMS, MUROMBEDZI, 2005, WEST et al., 2006). Besides, most of the opportunity costs of the establishment of protected areas were bore by local peoples (GOSSLING, 1999). During those times there was ample acceptance of the need to include local people in the conservation equation - as the International Union for Conservation of Nature (IUCN) president had argued in 1992: “if local people do not support protected areas, then protected areas cannot last” (ADAMS et al. 2004). Tourism was one strategy in conservation and development projects: in 2002 the UN Environment Programme invested US\$ 7 billion in 320 tourism-related projects with 21 development agencies (ZEPPEL, 2006). More recently, however, critics

have portrayed conservation and development projects in general as under-achieving (KISS, 2004; CHAPIN, 2004), and have thus reenacted the old “parks *versus* sustainable use” debate.

Some have suggested that most of these projects were based in a flawed assumption that some financial investment and planning would be sufficient to promote good results in terms of poverty alleviation and conservation (MCSHANE ; WELLS, 2004). Others suggested their failures were due to the control of such projects in the hands of conservation professionals, who were not, allegedly, willing to establish a lasting and effective partnership with local communities (CHAPIN, 2004). One of the problems described in literature is that reviews of ICDPs fail to provide long-term accounts of their results and rush into conclusions that may prove to be, later, mistaken (BARAL; STERN; HEINEN, 2007). In addition to that, failure or success of these projects sometimes may not be measured in absolute terms, especially in regard to social contexts, which are dynamic and social attitudes, which are not homogenous among all people involved.

This paper provides a long-term account of the attempts to associate development and conservation goals in an ecotourism enterprise in a sustainable development reserve in the Brazilian Amazon. It investigates how ecotourism represented a motivation for the conservation of the area where it was implemented. The paper is divided into three sections: the first one reviews literature dedicated to the theme of the association between ecotourism and conservation and describes hypotheses that may explain the conditions under which these associations prevail. The second portion of the paper describes the social, political, and economic settings where the enterprise was implemented; the third section

¹ Department for International Development (DFID)

provides qualitative data that suggests different attitudes toward conservation within a determined timeframe and presents provisional conclusions on the theme.

ECOTOURISM: POVERTY ALLEVIATION AND BIODIVERSITY

Ecotourism is a fast growing segment of the tourism industry (IES 2008) that has been advocated as a market tool for conservation (GOSSLING, 1999; STRONZA, 2007). Definitions abound, but most of them emphasize three main elements that should be considered fundamental to all ecotourism enterprises: i) natural areas as destinations; ii) promotion of biodiversity conservation in those areas, and iii) socioeconomic benefits to local peoples (IES, 1994; BOO, 1992; HOONEY, 1999; KISS, 2004). Ecotourism practitioners expect correlations between generation of socioeconomic benefits to local populations and endorsement of conservation strategies in those natural areas where the projects are developed (Figure 1).

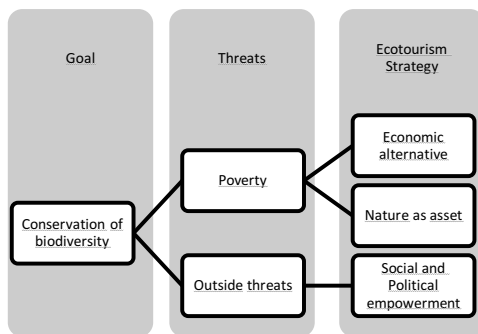


Figure 1 - Ecotourism as a strategy to counteract threats to biodiversity.

Integrated Conservation and Development Projects (ICDPs) main underlying assumption is that economic incentives are essential for nature conservation (WUNDER, 2000). ICDPs projects such as ecotourism are associated to the idea of sustainable development insofar as they are based in a premise that biodiversity degradation is closely related to poverty (AGRAWAL; REDFORD, 2006). Extreme poverty and biodiversity hot spots are coincident, concentrated in rural areas where livelihoods depend on natural capital (BARRET et al. 2011). Since it is believed poor people have no other alternative but to contribute to environmental degradation (BRUNDTLAND, 1987), ecotourism would be an alternative income and would work as an incentive toward biodiversity conservation not only because it relies on natural areas and their “watchable” species as its main asset base, but also because reduced poverty may allow local people to adopt a more long-term vision (WUNDER, 2000). When local communities benefit directly from biodiversity, they presumably have an incentive to stop external threats to it (BOOKBINDER; OSTROM; YOUNG, 1998). In addition to that ecotourism would help strengthen local efforts against outside threats to biodiversity by building skills and political empowerment of local communities (STRONZA; GORDILLO, 2008).

Some studies have not corroborated the hypotheses that with high economic benefits ecotourism would provide incentive to conservation (SALASFKY et al. 2001, STRONZA, 2007). Other variables, such as the distribution of benefits and synergies with other economic activities, also count (WILKINSON; PRATIWI, 1995; PERALTA, 2005). In fact, when economic benefits are high, but access opportunities are not evenly distributed, ecotourism may in fact exacerbate existing

resource conflicts due to a perception that costs of protection are bore collectively and its benefits individually. When this is the case, no matter how high economic benefits may be, it will not provide the expected linkage with conservation of the area. Some studies have shown that new income may indeed accelerate resource extraction by enabling local residents to purchase more labour and technology (BARRETT et al., 2001; FERRARO, 2001).

Besides that, results of ecotourism enterprises are difficult to be measured not only because most projects lack baseline data, but also because both biodiversity and poverty are multidimensional concepts that are difficult to be calculated. For one, biodiversity entails different components (genes, species, and ecosystems) and attributes (composition, structure, and function) (AGRAWAL ; REDFORD, 2006). Poverty, on its turn, is a concept that involves not only economic aspects, but also political and social ones, and is always culturally-sensitive. For Amartya Sen (2000), the utility of wealth is related to what type of personal goals it allows one to achieve – or how it enhances one’s capabilities to lead the type of life they have reason to value. Therefore, according to this perspective, income is an inadequate measure of development, and its sole use will only tell half of the tale.

Other problem faced by analysts is the difficulty in establishing causal mechanisms between ecotourism enterprises and conservation outcomes. Since both aspects may be interrelated to a variety of other variables, rather than that of ecotourism itself. Thus, although some association between income generation and conservation may exist, because it is indirect, showing it becomes a difficult task.

But a few studies have accomplished to deliver a causal analysis. Salasfky et al. (2001) for example, conducted analysis on the conditions under which an enterprise strategy would lead to conservation. Their findings showed a weak association between enterprise success and conservation success, but a strong association between local involvement (through management and ownership) in the enterprise and conservation success. Baral; Sternand; Heinen (2007) showed, after a ten year timeframe analysis, that ICDPs did promote shifts from institutional and economic development *foci* toward more conservation activities. They also argued that failure to devolve real power leads to diminishing participation as members lose interest. Coria and Calfucura (2012) have argued that success of ecotourism is dependent on three main factors: i) distribution of benefits, ii) community control over land and resources, and iii) power relations between stakeholders.

Besides that, other factors like human and social capital are fundamental in determining failure or success of these ventures. Lack of skills and experience in ecotourism planning, business and financial management, marketing, and the fact that partners (NGOs and businesses) take on these tasks, prevents the formation of human capital within communities (ZEPPEL, 2006). These paternalist roles played by stakeholders in development and management of ecotourism do not contribute to the long-term empowerment of local people or the autonomy of the enterprises (CORIA; CALFUCURA, 2012).

Social capital is also an important asset of communities that successfully develop ecotourism enterprises (STRONZA; GORDILLO, 2008). According to Putnam (1993) social capital may be understood as the set of networks, reciprocity

and trust that are present among members of a group (bonding) and between social groups (bridging). Social capital has a positive correlation to conservation governance (BRONDIZIO; OSTRON; YOUNG, 2009; FOLKE et al., 2005) because it allows group members to overcome collective action dilemmas (HARDIN, 1968; OLSON, 1999), which could otherwise prevent cooperation toward common goals. Aside from economic changes, ecotourism may also trigger other social effects that may either enhance or erode social capital – like new opportunities to network with outside peoples and organizations (STRONZA; GORDILLO, 2008) or social conflicts over distribution of resources. In order to counter internal and external threats to biodiversity, however, communities must have some social cohesion and strong leadership (both social and human capital). If ecotourism is to be a positive influence on these factors, community should guide its development from the feasibility stage through to its implementation (SCHEYVENS, 1999).

Lee (2012) conducted a study that aimed to assess the support of community residents for sustainable tourism development. His findings showed that increased involvement in decision-making processes and perceived benefits of tourism are fundamental to attain local support. For Stronza (2007) perceived benefits are more important than actual economic benefits, since her research showed willingness to be involved in ecotourism work, despite relatively minimal economic return. For Salasfky et al. (2001) non-cash benefits were also important to promote trust and cooperation between key stakeholders.

According to these studies, the conditions that allow association between ecotourism development and

conservation are not strictly economic, but include other aspects such as social capital, distribution of benefits, and local empowerment. What is important to note is that the perceived benefits of ecotourism development by local residents is key to the promotion of this association.

UAKARI LODGE: COMMUNITY-BASED ECOTOURISM DEVELOPMENT

Mamirauá Reserve: antecedents

The *Uakari* Lodge is an ecotourism enterprise located in the Mamirauá Reserve in the middle Solimões in Brazil, near Tefé, a town around 500 km away from the capital of the Amazonas state, Manaus. A population of about 9700 people, distributed in 181 communities, inhabits the area (MOURA et al., 2012). Communities are usually formed by households related by kinship. These settlements are politically grouped in *setores*, or sectors, that is, a set of communities located geographically near each other, which are politically involved and take collective decisions about the use of common resources. Communities must engage in sector activities such as participation of meetings and assemblies, and vigilance of their territory and resources. The whole of the Reserve is divided into 17 sectors.

The creation of the Mamirauá Reserve in 1990 was the result of an association between leaders of a popular social movement (called Preservation Movement) and a group of researchers who, during the eighties, combined efforts toward the common goal of protecting the area from commercial predatory fishing and logging (REIS, 2005; PERALTA, 2002). The Preservation Movement was first promoted by the local Catholic Church, which had in the previous decade, been involved in organizing locals in

politically independent communities. Prior to that, people were dependent on a debt-bondage system of patronage locally known as *aviamento* (LIMA-AYRES, 1992). When rural commerce declined and patrons moved to urban towns, settlements were scattered along rivers and channels. During the seventies, due to a rise in productivity of the fisheries industry and decline of stocks near urban cities, like Manaus and Itacoatiara, large vessels navigated upriver to deplete stocks on which these communities' livelihoods depended on (DERICKX, 1992). With the support of local Catholic Church, these communities created a management system, which divided lakes in different categories – preservation, subsistence and free lakes. The first two types were to be protected by members of the communities from exploitation of outsiders; the latter was allocated to the commercial fishing sector. As the Movement lacked legal basis, all preservation efforts like the zoning system, apprehension of poachers' materials, etc. were challenged by local political elites (REIS, 2005; PERALTA, 2002). The partnership with researchers for the creation of the Reserve in 1990, gave the protection of the area an official, legal status. The challenge afterwards was to create a strategy that would enable local peoples to inhabit the area and use its resources sustainably. A Non-Governmental Organization (NGO) was created in 1992 to manage human and financial resources dedicated to the implementation of the protected area – Sociedade Civil Mamirauá (SCM)² – which was granted co-management of the area by the Amazonas State.

During the early nineties researchers and local leaders set out to elaborate and agree upon a zoning system and set of norms for the use of

natural resources. In 1996, they achieved this objective, publishing a management plan. The zoning system destined a core area as a totally protected zone, where human settlements and use of natural resources were prohibited. Surrounding this core area a sustainable use zone, where most of the settlements were located and economic productive activities could be carried out. The assignment of a protection zone with restrictions for productive use was regarded as a cost for local communities, which would bear economic losses resulting from the restrictions imposed by the management plan (SCM, 1996). Thus, a set of alternative income activities were also proposed in the management plan, among them, fisheries management, forest management and ecotourism.

Economic activities which will, concomitantly, diverge the demand pressure on natural resources locally threatened, or maintain it under control, and, complementarily, raise household income (...) preferably of those inhabitants most affected by the limitations of the norms of use of this management plan (SCM, 1996).

An ecotourism enterprise was planned to be developed in Mamirauá sector, within the totally protected zone near the Mamirauá Lake – an area subject to pressure from large fishing vessels that would extract tons of fish at a time.

Mamirauá sector: sociopolitical and economic settings

Communities are local settlements of people related by kin, with about 10 households in average. They have been established with the support of the local Catholic Church. They usually comprise some basic infrastructure such as a community

² In 1999 another institution was created and later qualified as a public utility by the federal government: the Mamirauá Institute for Sustainable Development.

center, a church and school. Political leaders are elected and responsible for representing community interests. Local inhabitants are subject to a communal order that supposedly makes them observe collective decisions regarding the use of natural resources (LIMA-AYRES, 1992). Thus, even when no formal sanctions are applied, violators suffer some social censure.

Two communities have participated more intensively in the preservation movement during the eighties and the creation of the reserve in the nineties: Boca do Mamirauá and Vila Alencar. The two communities, although related by kin, have a history of political disputes. Most current disputes also convey family quarrels that date back to their first fission in the eighties.

Households' livelihoods are dependent on natural resources, especially fisheries, timber and high lands for agriculture (LIMA, 1997). Most of them perform a combination of these economic activities, depending on the season. Production is destined both to consumption and to market exchange. Income generation comes from sale of produce (especially fish and manioc flour) salaries and government income-transfers programs. Aggregate data shows that household monetary incomes have improved in the past fifteen years (PERALTA et al., 2009), but they are

still low compared to other rural areas in Brazil. Education and health indicators suggest low standards of living. Only 58% of the population older than 10 years old is able to read (MOURA et al. 2012) and, although the situation has improved in the last 15 years, high infant mortality rates still prevail in the area (35‰) (IDSM, 2010).

At the beginning of ecotourism developments, Mamirauá sector had seven communities with about 70 people in average, and about 500 people in total (IDSM, 2001). Nowadays, there are eleven communities with a total of about 750 people (IDSM, 2011). There was a growth of about 50% in the total population

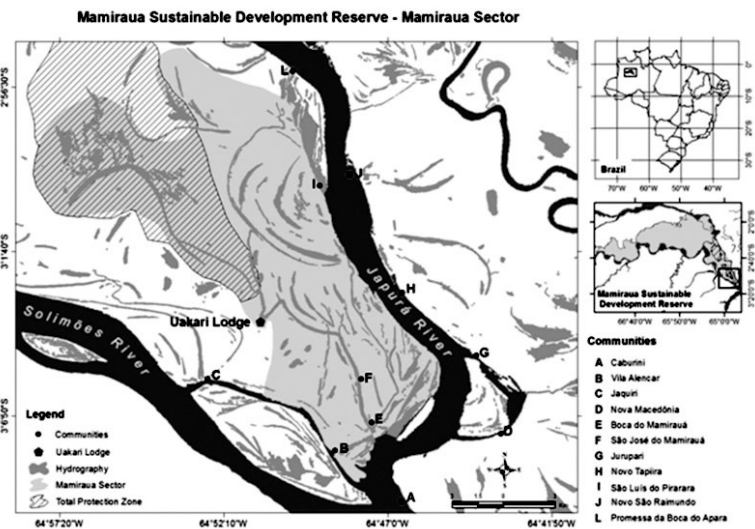


Figure 2 - Location of Mamirauá Sector Communities and Uakari Lodge.

of the area. These new settlements³ did not engage in the preservation movement as the ones previously mentioned and were not as involved with outreach activities developed by the Mamirauá Institute.

Uakari Lodge: tourism and conservation

Originally, it was thought that the ecotourism enterprise would be able to generate income and fund activities in the whole of

³ Sítio São José do Promessa, Jurupari, Novo São Raimundo.

the Reserve. After an economic feasibility study that proposed that an investment of US\$ 400,000.00, with maximum numbers at 1000 visitors, would generate an internal return rate of 16% in ten years, an international development agency - Department for International Development (DFID) - agreed to contribute to development funds as a catalyst for development of ecotourism. It was then realized that financial results of the enterprise would never be so bulky as to accomplish its first objectives, but would only be able to generate income to the seven communities in that sector. Nevertheless, the enterprise should provide support to the overall marketing and public relations of the Reserve and the NGO, thereby aid fundraising activities.

Enterprise was divided into three main phases: planning (1997-1999), development (1999-2002) and operation (2002 onwards). These were seen as cyclical, where monitoring of product and services in the operation stage also served as subsidies for further planning and new developments. A small group of three people within the NGO was responsible for ecotourism venture. Before development of the project, preliminary planning consultations took place with communities living in the Mamirauá sector. Although these consultations were very cautious not to raise false expectations (RIN, 1998), there was "some confusion over unrealistic expectations of job creation and the possibility of communities charging tourists for access to trails" (HARRISON; SHANKLAND, 1998). But local reactions were positive: communities contributed ideas for guiding, garden produce, and community visits. Local ecological knowledge was used to design infrastructure and product development. Albeit there was much community involvement, most of strategic planning and decision-making was carried

out by project staff. This was due to the belief that the Mamirauá sector communities needed further strengthening of its organization and leaderships to be able to participate effectively in the ecotourism development (HARRISON; SHANKLAND, 1998).

During the first two years the focus was on infrastructure and product development, training of and building on local skills, hosting spontaneous visitors and designing monitoring mechanisms. Besides that, continuous liaising with local communities was carried out in order to gain their support. Meetings were promoted between ecotourism staff and local communities in order to exchange results, challenges and prospects of the enterprise.

The initial development phase included hosting spontaneous visitors, so staff and local communities gained experience in running the operation (RIN, 1998; PERALTA, 2002). In addition to that, this experience proved to be fundamental to understanding market demands and designing a product which would attend to its expectations.

Some planned activities were not finalized during this stage. The organization management structure was not defined, some environmental permits were not attained and monitoring methods were not clear. In addition to that there was no clear definition regarding revenue-sharing until the end of 2002. As a report had put it, "asking the communities in Mamirauá sector to accept certain disruption now for uncertain rewards later is not likely to encourage strong local support for the ecotourism venture" (HARRISON; SHANKLAND, 1998, p. 27). Despite this uncertainty, enterprise development continued, albeit only two communities out of seven were actively engaged in the process of developing the initiative.

During this stage, only a few jobs were created and economic benefits were not too diffused. But community involvement was seen as key to the success of the venture, and most importantly, to providing linkage between ecotourism and conservation. The group sought to involve more communities (both in quantitative and qualitative terms) and the strategies were to offer more temporary jobs, buy more local products, promote tourist visits in local communities, and build on social capital by supporting local associations, as well as trying to create a sense of ownership of the venture. The result is that other two communities became more involved, and a total of four were actively engaged in the activity by the end of 2000, receiving the bulk of direct economic benefits and hosting visitors (Figure 3).

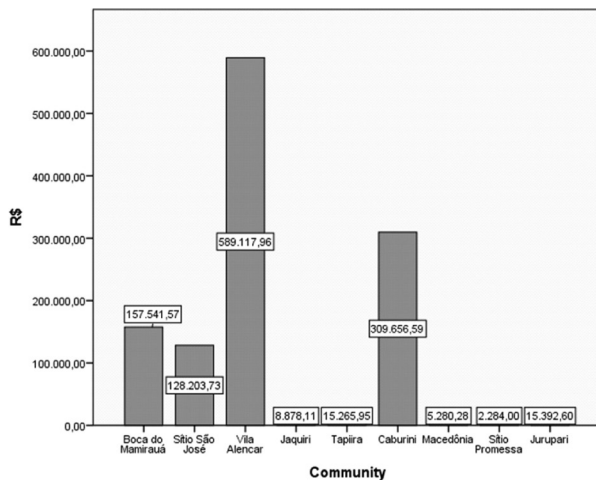


Figure 3 - Total income generated to local communities from tourism (1999-2011)

There was a common understanding that the more benefits were shared, more people would support not only the enterprise but adhere to the conservation goals of the project. Thus, more temporary jobs were created by developing a

rotation system where service providers would supply a group of guests at a time, and wait until all other service providers had a chance to work. But a problem ecotourism practitioners face is the fact that income from ecotourism is variable and dependent on external factors (such as foreign currency exchange rates, the ups and downs of a globalized economy, and the tourism infrastructure available). Thus, besides having the objective of distributing economic benefits, the rotation system was designed to prevent local dependency on tourism income, since it is a very unstable economic activity. The idea was to develop ecotourism as an alternative source of income that should not substitute more traditional activities such as agriculture and fishing.

It was clear though that locals lacked the professional skills needed to manage the lodge. There was a need to build on skills and capabilities. So a series of courses, training sessions and internships were designed to improve management and services. But more long-term training programmes could not be undertaken, mainly due to restrictions in terms of time available to staff, and the fact that these courses were not offered locally, but only in larger towns such as Manaus. Other problem was the lack of formal education of employees and temporary staff, which had in average four years of low-quality schooling. So although, there was success in developing skills in guiding tours, hotel housekeeping, and other services in general, locals still lack experience in marketing, product development and financial management. These have been provided by the institution that offered long-term technical assistance to the lodge.

In addition to that, other problems prevented the integration of more communities in the ecotourism enterprise – one of them was the lack of infrastructure for communication. Only three communities had means to establish contact with the Uakari Lodge via VHF radio (Boca do

Mamirauá, Vila Alencar, and Caburini ⁴), the others - located far from the lodge and with no radio communication system available - could not be contacted on a daily basis by lodge staff or the local association, and therefore were not able to provide services and goods to the lodge and did not receive much economic benefits from the tourism activity.

Over the years, most economic benefits coming from provision of goods and services were accessed by four communities (Figure 3). A Gini coefficient was used in order to provide a comparative measure of the degree of tourism income inequality among those people who had access to economic benefits. Low Gini coefficients indicate more equal distribution, while higher Gini coefficients indicate more unequal distribution (in a scale from 0 to 1). We considered income inequality between the population that had access to economic benefits from tourism over the years and compared inequality rates in different years. Our data has shown that in general the income is not concentrated in one part of the population, since the level of inequality is relatively low. Although we have to point out that Gini coefficients only consider that portion of the population which was able to access economic benefits and this varied over the years. The number of tourism beneficiaries in the sector ranged from 48 in 1999 to 120 in 2007 (see Table 2) in a population of about 380 adults. The most unequal distribution of benefits occurred in 1999 and 2003. A sharp drop in inequality occurred in 2004, year when a local person became responsible for the management of the lodge. After that, inequality rates ranged from 0,18 to 0,22 until rising to 0,28 in 2011.

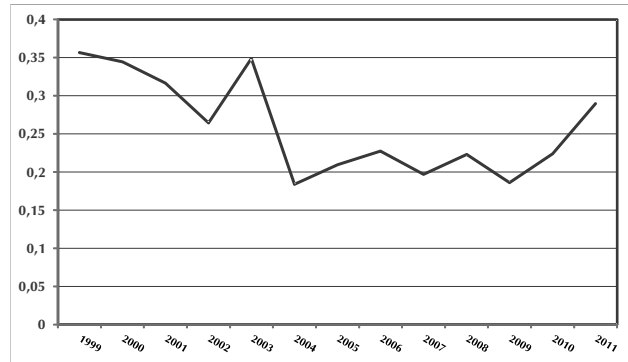


Figure 4 - Evolution of Gini coefficient indicating inequality in distribution of ecotourism income.

In order to involve more people in tourism and derive more support to the activity there was a need to clarify how other segments of local communities would also be involved and benefit. Economic transfers from the lodge to communities could be justified by different rationales: payments for compensation of disruption, royalties as payments for access to the area, or payments as profit shares, if communities were seen as proper investors (HARRISON; SHANKLAND, 1998). In 1999, in a general assembly involving all communities in the Reserve, representatives of the Mamirauá sector⁵ signaled which type of payments they wanted. They proposed an entry fee to be charged from both tourists and researchers entering the area, which should be reverted to its environmental protection and investments in local communities. The fee was not instituted, mainly because it was not accepted by SCM staff, which associated the idea to the lack of clarity regarding profits from the tourism venture (SCM Annual Assembly Report, 1999). But the proposal made two things clear – local leaders saw tourism as a source of funds for the protection of the area, and participation in

⁴ Sítio São José did not have a radio but was located in the way to the lodge, so it was possible to establish communication easily.

⁵ Environmental agents, sector coordinator, tourism employees.

decisions about community payments needed to be developed as soon as possible.

By 2001 an internal committee was created to discuss community payments. The NGO staff proposed a system of profit sharing following the rationale that communities were partners in the venture and should therefore share costs and benefits. Their initial idea was to establish a fund with 30% going for investment in communities' projects, 30% to environmental protection, 15% to environmental education, and 25% in further investment in the lodge. And only communities directly involved with tourism should benefit. After further discussions, the proposal finalized was 50% investments in the protection of the area and 50% investment on communities' projects. It was argued that environmental education should be an activity developed throughout the year and with other sources of funding. And an annual investment rate in the lodge's infrastructure should be put aside every year, before distributing benefits among communities. There was a common understanding that some of the Uakari lodge's main assets were the natural area and its abundance of resources, including charismatic species such as pink dolphins, primates and birds. Therefore, investments in the protection of the area would guarantee its sustainability in the long run. Besides that, those investments would also benefit communities, since they would represent protection of other important natural resources such as fisheries.

This proposal was presented to each one of the communities in Mamirauá Sector. Local leaders involved directly in the community-based protection system, were in favor of destining 50% of profit shares in the protection of the area. Since they were the most vocal and politically active leaders,

they helped to persuade those communities not in favor, which were not involved in the system, and, on the contrary, tended to transgress more frequently local management rules.

Communities also decided that they should share equally the remaining 50% of profits shares, which should be applied in projects that benefited the community collectively (Table 1). The Mamirauá Sector coordinator ⁶ suggested that the equal distribution of shares among the seven communities was a chance for those communities which did not collaborate with sector activities (vigilance, participation in sector meeting, etc.) to become more involved. He suggested that in the following year profits should be divided according to the level of community participation and level of compliance to local management rules (Ecotourism Program Report, 2002; PERALTA, 2005), and all communities agreed. The rules were relative to community participation in sector meetings, participation in environmental protection activities, respect to the norms of natural resource rules, and rules regarding ecotourism activities. A committee with one participant from each sector community was composed and responsible to evaluate communities' compliance to sector management rules.

The sector coordinator used this opportunity to assemble support from those communities which were not involved in organization at sector level. It was a means of strengthening the sector and drawing together other allies for the protection of the Mamirauá lake system. For leaders of communities least involved with the community-based protection system, profits coming from

⁶ A leader trained by the Catholic Church, who had been very active in the preservation movement and worked for the NGO and later for the Mamirauá Institute

Table 1 - Communities' decisions regarding Uakari Lodge's first profits shares in 2002.

Questions	Communities' answers
Who should decide about the destination of profits from the lodge?	Mamirauá Sector
How?	By the means of agreements among communities
Who should benefit from economic benefits?	All communities from the Mamirauá sector
How should economic benefits be divided?	In equal parts among communities
What would profits be invested in?	Local housing (Jaquiri);
	Construction of Community Centre (Boca do Mamirauá, Caburini, Nova Macedônia, Vila Alencar and Novo Tapiira);
	An engine to transport agricultural production (Sítio São José)

tourism served as justification for the protection of that area. As mentioned above, since local inhabitants are subject to a communal order that supposedly makes them observe collective decisions regarding the use of natural resources (LIMA-AYRES, 1992), the association between profits shares and the compliance to management rules, imposed new social censure to violators.

From 2002 onwards the lodge was fully operational, and marketing strategies started to be implemented. There was a 25% annual increase in arrivals from 2000 to 2005. But in the years 2006 and 2007 the local airport closed down, and this impacted operations. The gateway town to *Uakari Lodge* (Tefé) is not accessible by road, and many visitors would not use other transport options, like boat and speedboat, because they were too time

consuming. This resulted in a sharp decrease in guest numbers after 2005, which also impacted economic results over the years, and subsequently it hindered profit shares.

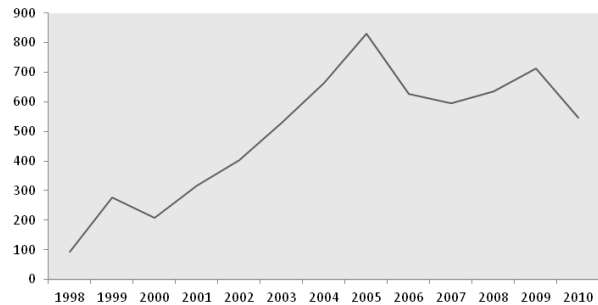


Figure 5: Uakari Lodge visitor numbers

The committee responsible for assessing community members' compliance to sector management rules only performed its role appropriately when there were profits to be shared. When there were none, the committee did not evaluate performance of communities regarding those rules. According to local leaders, the level of sector organization and attention to the sector management rules were related to the presence of economic profits shares from the tourism activity. Since there were no expectations of receiving shares in the years 2006 and 2008, people did not obey local management rules.

[Environmental agent]: Everyone erred! What happened was that everyone knew there would be no profits shares from ecotourism; so many people invaded the *ecotourism* area. People said that there a lot of poaching (*invasão*) because there were no profits. But I think that with or without profits, everyone has to obey the rules (Sector meeting, February, 2008).

After a few years of protection the Mamirauá Lake system had recovered stocks of economically-important fish such as pirarucu (*Arapaima gigas*) and tambaqui, (*Colossoma macropomum*). With the recovery, pressure on stocks from fishermen from nearby communities and towns followed. More efforts were needed to protect the lake system from poachers (*invasores*⁷), and this invariably fell on the shoulders of local environmental agents, albeit with a great deal of logistical and financial support from the Mamirauá Institute.

From 2005 onwards, a group from within the Mamirauá sector started negotiations to alter the Mamirauá Lake category from total protection to sustainable use, thereby claiming access to its fish stocks. An informal sector fishermen organization was created, and included many inhabitants from communities which had not previously participated in sector activities, like Novo São Raimundo, Sítio Promessa and São Luiz do Pirarara. Their argument for changing the protection category of the lake was based on the fact that for many years the lake had been exploited illegally by outsiders. At times they argued that the lake was overexploited by clandestine fishermen:

Community people evaluated that since the 9th of March 1990⁸ until 2008 - 18 years of preservation – every year fishermen invade the area. Once we drove out of this lake about 50 canoes of clandestine fishermen. This year of 2008 fish are very rare in the Mamirauá Lake, because many tons of fish were taken out by clandestine fishermen. There have been many expenses from the work partners, and few results. Now the

people are planning not to preserve any more fish for clandestine fishermen. They plan to negotiate the area in a way so it will not bring damage to Mamirauá Lake (Mamirauá Sector Meeting, 21/10/08).

Other times they argued that albeit much exploitation, the lake still had a lot of fish:

The inhabitants pointed out that [the Mamirauá lake] was fished along 20 years by clandestine fishermen, with different types of fishing, predatory, without norms, fishing small as well as large fish, and there is still fish in Mamirauá lake. The organized fishing [proposed by their group] will be controlled and managed according to the use norms, and respecting closed reproductive seasons. (Mamirauá Sector Meeting, 28/10/11)

Both arguments served to convey one message: they were “keeping for others to take” (*guardando para os outros levarem*), that is, for them their efforts for preserving the area were producing economic results to other people, not themselves. This argument was convincing many local people, since it was used by leaders and community environmental agents, people who were directly involved with the protection of the area over the years.

Nevertheless, not everyone agreed with such understanding. There was a group which actively opposed it – among them those who worked at Uakari lodge and associated the protection of the Mamirauá Lake to tourism (see below). In order to hinder attempts to change Mamirauá Lake’s category, they counter-argued that many people in the sector were receiving benefits from tourism, and they needed the area to remain preserved to attract tourists (“é o nosso atrativo”). At that time, the importance of maintaining the lake as a total

⁶ Those who extract natural resources without legal rights or local consent.

⁸ The date of the decree establishing the Mamirauá Ecological station.

preservation zone was not perceived locally in ecological terms, but in terms of its economic dividends. This was when the whole issue started to be put as a mere choice between using the lake for fishing or destining it to tourism activities. This was clearly reflected in one meeting agenda to discuss the issue: "Fishing or ecotourism".

In addition to that, the group argued against the inclusion of fishermen from communities which had not contributed to protection of the lake over the years. They claimed most fishermen from those communities were actually poachers (*invasores*), and they did not understand why local environmental agents and their own sector leader could agree with them reaping benefits, having bore none of the costs of protection.

[Names of sector coordinator and environmental agent] carried out an illegitimate fishing activity on 14th of September, 2005 in lakes Mamirauá, Teiú, Jacitara, Levir and Mamirauá channel, with 52 fishermen [...]. *We are worried because it is an untouchable area, for preservation of the ecotourism area, where many inhabitants are working in favor of preservation and not destruction of this area. Some environmental agents do not agree with this second fishing. Mamirauá sector has seven communities and they [fishermen organization] are presenting eight communities, and most of these fishermen are poachers, some of them are [names] and others from Tapiira, São Raimundo. We do not accept this fishing in our area (it is our [tourist] attraction). 17/09/2005 (Signed 13 people: four from Boca do Mamirauá, eight from Sítio São José and one from Vila Alencar) (free translation).*

For many years, the two groups struggled over the issue, without resolving it. Fishermen attempts to fish in Mamirauá lake were counteracted by

lodge employees who followed their organization closely, participating in their meetings and keeping track of all fishing trips and collective decisions. But in 2008, fishermen assembled more support to their claim justifying that ecotourism benefitted the community collectively (through profits shares) but was not economically important to local families (see below). This was clearly not the case of those communities that had received the bulk of economic benefits throughout the years⁹ (Figure 3). But it was the case of communities in the Japurá River, which had never had much economic benefits from providing goods and services to *Uakari Lodge* (see Figure. 3). Those communities had in fact less income than the ones involved in tourism activities. Data from an economic survey carried out in 2011 showed there was indeed a 34% difference in household incomes between those communities that worked with tourism and those who did not. The fishermen group was in fact formed mainly by people from those communities.

With this area destined to research, ecotourism and others, we confirm that we had much economic damage. Only now we have found out that we have been rowing all the years against our fishing initiatives. Today we are aware, according to our knowledge, that this [fishing in the protected zone] will not have any impact, it will only bring more benefits and generate more income to the family. We concluded that income from ecotourism is important, but it does benefit families, it benefits communities in common, while there are families in need of its own income for a healthy social living. We are willing, together with all from the

⁹ In 2008, around 120 people received direct economic benefits from tourism (see table X).

sector, to negotiate the area of Mamirauá lake, *leaving other area for preservation*, maintaining respect of all in the sector, fish only according to rules, with no exaggerate exploitation, and only in the right periods of time. The area that goes from the entrance of Mamirauá Lake to *Volta do Pagão*. We request Mamirauá Lake for subsistence. And we ask the support of everyone from the sector in this assembly. 21/10/2008.

The Mamirauá Institute opposed the modification on the lake protection status. Its technicians tried to show the importance of maintaining a total preservation lake in a *pirarucu* management system. An argument promptly integrated by the fishermen, who proposed to exchange lake Mamirauá for another one (Jacitara). For them, if fishing was carried out according to management rules – respecting the closed season, the minimum size of fish and a fishing quota - it would not cause any impacts. But researchers considered that Mamirauá lake system was of ecological importance to the whole of the Reserve and opposed its substitution, since other lakes did not have the characteristics required for a preservation lake, such as depth and connectivity. But as the statement above shows, local fishermen saw the preservation of the Lake not as a part of the Reserve's zoning system that had been previously approved by residents themselves, but as an area that was categorized as preservation to be destined to research activities and ecotourism. Besides, they were stating that destining the area to those activities had resulted in *economic damages*.

Furthermore, fishermen were trying to show that protection had not been effective because there were not enough human or financial resources available, since the State was not able to provide such resources. Even though the protection of

the area was supported by Mamirauá Institute, they maintained that protection was a result of the contribution of local people who had been voluntarily involved over the years, but with the long-term purpose of obtaining economic benefits in return. But, by their evaluation, until then, only clandestine fishermen were really benefitting from the protection of the area, and if there was the possibility to manage *pirarucu* fish in Mamirauá Lake, locals would engage more in protection and refrain from exploiting the area illegally.

In 2009, with all of these arguments, fishermen requested the change in Mamirauá Lake conservation status at the annual General Assembly. Since it was understood that this was a change in the zoning system of the Reserve's management plan, they were advised to request this modification from the Reserve Deliberative Council¹⁰, which they did so in 2010 and 2011, when the Council finally approved the alteration in the protection status of Mamirauá Lake. In May 2012, a small group of residents from Mamirauá sector took to the council their views opposing fishermen initiatives, arguing not only for the importance of the lake to tourism, but also to the maintenance of the area as a breeding ground. Making it clear that the change in the status of the lake was not consensual among locals.

Despite all that, a fishing quota of five tons was granted by the state agency¹¹ organization responsible for the management of the area. In September 2012, a group of around 40 fishermen

¹⁰ The Deliberative Council is the main decision-making forum responsible for the major issues regarding the use, management and protection of the area.

¹¹ Centro Estadual de Unidades de Conservação – CEUC.

carried out a commercial fishing expedition taking out around 27 tons of tambaqui (*Colossoma macropomum*) from the lake in four days, which resulted in a total gross revenue of R\$ 180.000,00¹². Due to alleged irregularities in the fishing expedition, the group of fishermen was later fined by another state agency¹³.

Table 2 - Mamirauá Sector incomes generated by Uakari Lodge and management decisions regarding the use of the area.

Year	N tourism beneficiaries	Income from tourism ¹	Average income per person	Uakari lodge profits shares	Management decisions regarding the use of the area
1999	48	R\$ 16.429	R\$ 342	-	Communities requested entrance fees from tourists and researchers at General Assembly
2000	50	R\$ 19.449	R\$ 389	-	
2001	43	R\$ 20.357	R\$ 473	-	
2002	69	R\$ 35.808	R\$ 519	R\$ 35.000	Equal distribution of profits among seven communities
2003	82	R\$ 43.254	R\$ 527	R\$ 60.000	Sector leaders define management rules that include participation in protection and sector organization. Profits shares according to compliance to sector rules
2004	93	R\$ 105.099	R\$ 1.130	R\$ 65.000	Sector defined new total protection zone surrounding Uakari Lodge (Volta do Pagão)
2005	102	R\$ 129.406	R\$ 1.269	-	Informal foundation of local fishers' organization. Illegal fishing in the total protection zone.
2006	103	R\$ 104.242	R\$ 1.012	-	Local fishers requested part of the total protection zone in sector meeting. Local tourism association gained support to deny access.
2007	120	R\$ 121.298	R\$ 1.011	R\$ 27.240	
2008	116	R\$ 151.083	R\$ 1.302	R\$ 30.574	Fishermen gathered more local support to change the protection status of Mamirauá Lake
2009	118	R\$ 171.691	R\$ 1.455	-	Communities requested Mamirauá Lake for fishing at General Assembly
2010	120	R\$ 162.143	R\$ 1.351	-	Communities requested Mamirauá Lake for fishing at Reserve Council
2011	112	R\$ 151.452	R\$ 1.352	-	Reserve Council agreed to change the category of Mamirauá lake from total protection to commercialization
2012					Commercial fishing of around 27 tons of tambaqui (<i>Colossoma macropomum</i>) in Mamirauá Lake

¹ Mamirauá Sector total income generated from provision of services and goods to Uakari Lodge.

¹² Gross income and not net revenues coming from fishing.

¹³ Instituto de Proteção Ambiental do Amazonas – IPAAM.

Conclusions

Gross revenues from fishing on its first year of operation have shown to be larger than those coming from tourism along the years. Tourism highest net direct revenues were of R\$ 171.691, (see Table 2) in the year 2009. According to locals, this has attracted more interest in fishing in Mamirauá Lake, and may change the balance of power between those who support and those who do not support the fishing initiative, though this remains to be confirmed in the next few years.

The linkage between tourism and the preservation of the lake did occur in this case study. In the first years of its implementation tourism provided an incentive to stop *external* threats. But in relation to internal disputes, this linkage has proved to result in ambiguous outcomes. On one hand it has been a motivation for those who benefited from tourism to try and maintain the protection status of a lake which they saw as important for tourism. On the other hand, it has been the justification of those who wanted to change total protection status of the area, since they related the protection of lake to tourism and did not see the activity as profitable to themselves, they justified destining the lake to other ends rather than preservation.

To those communities that had no access to direct benefits, when communal benefits did not flow, incentive to maintain the preservation status of the lake diminished. Communal participation in benefits should be seen as part of the costs of the enterprise to gain support from local communities since the very beginning, and should not have been

only associated to the profits, since profits shares are much riskier. This had already been signaled by local communities back in 1999, when they claimed the right to charge entry fees into the area from tourists.

The case study also corroborates to the assumption that perceived benefits are more important than actual ones (STRONZA, 2007). In this case, even though the number of beneficiaries did grow over the years reaching a maximum of 120 people in 2007, or about a third of the sector adult residents, many people did not recognize the economic importance of the activity. Besides, this study has shown that privately appropriated benefits were perceived by locals as more important than collective ones. This was actually used as argument against the relative importance of tourism: *"income from ecotourism is important, but it does benefit families, it benefits communities in common"*.

Although economic benefits have not been too high over the years (average per person income was of R\$933; std. dev. R\$420), especially due to the fact that visitor numbers were impacted by the closure of the airport, the income that tourism did provide was important to locals. This is shown by the fact that there was a 34% difference in average income between communities with and without ecotourism involvement.

However, there was a concentration of benefits in only four communities out of eleven. So the study also shows that when tourism generates important economic benefits, but access opportunities are restricted, the activity exacerbates already existing resource conflicts due to a local perception that costs of protection are collective, but benefits are concentrated. A finding analogous to that of Coria and Calfucura (2012), who argue that inequitable distribution of benefits within the

community discourages participation and creates or exacerbates divisions.

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