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DIIS Brief

Biodiversity conservation in the context of poverty, greed and weak institutions – lessons learned from Indio Maíz, El Castillo, Nicaragua

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Introduction

National governments around the globe have committed themselves to work to conserve and promote the sustainable use of biological diversity, e.g. in the UN Convention on Biological Diversity of 1992 Protected areas constitute an important element in efforts to meet this commitment. Often, however, the declaration of protected areas is met with local opposition. The response during the last decades has been to seek local support for conservation through so-called Integrated Conservation and Development (ICD) projects. The efforts by the Nicaraguan government, in part supported by Danida, to promote conservation and development in Biological Reserve Indio Maíz and its buffer zone in the municipality of El Castillo is one of such efforts. Worldwide, however, disappointment is mounting with respect both to development and conservation outcomes of ICD efforts.

Based upon collaborative research in El Castillo by Nicaraguan and Danish researchers, this paper points to a number of shortcomings associated with such efforts. Among these are the following:

- Efforts to generate local support for conservation through development initiatives, including economic incentives such as the emerging schemes of payments for environmental services, tend to reach only part of the population. This obviously limits support for conservation.
- Many ICD initiatives address the development needs and environmental awareness of local people. But often interests related to timber and land are held by powerful external actors. These external actors tend to be overlooked when adopting the ICD lens.
- Many protected areas are located in 'agricultural frontier' areas, often characterized by the lack of generalized social networks, trust and security. In such areas the extent to which local people are likely to exert social control to ensure conservation and sustainable use of natural resources is limited, particularly if they cannot count upon consistent support from relevant environmental and legal institutions.

The Indio-Maíz Biological Reserve

The Biological Reserve Indio Maíz (RBIM) is known in Nicaragua as well as internationally as a well conserved area of tropical forest which presents an enormous and far from fully documented richness, both in terms of biodiversity and in terms of diversity of ecosystems. In addition to its biological values, RBIM and its buffer zone are, however, also known as a highly contested area, being a battle zone during the war in the 1980s, and currently being perceived as an area where land is 'cheap and free' and as an area with valuable forest resources, just waiting to be exploited. The presence of actors involved in the colonization and in the extraction of forest resources – of which around half is estimated to be illegal (Paniagua, 2003) – combined with the weak presence of state institutions have profound impact on the character of economic and social relations in the area.

RBIM was declared a protected area (biological reserve) in 1990. In 1999, the limits of the protected area were slightly changed, which meant that communities which hitherto had been located outside the RBIM suddenly found themselves inside. While some families have been compensated, being allocated land outside the RBIM, others have not, and still more families have settled inside the protected area. Being protected under the category of biological reserve implies that no human activity except for research and monitoring activities is permitted inside the protected area. Thus, the presence of communities inside the protected area clearly complicates the enforcement of protected management norms. RBIM forms part of the Biosphere Reserve Río San

Juan which was formally recognized by UNESCO as part of its Man and Biosphere programme in 2003.

About IBESo

In October 2003, DIIS was asked by the national coordination unit of the environmental sector programme support (PASMA, Danida) to explore the options of forming a multidisciplinary research team comprising Nicaraguan and Danish research institutions with expertise both within the biological and the social sciences. The result of this exploration was a research programme proposal which was presented to PASMA in February 2004 and was approved in April 2004. IBESo formally started in May 2004 and concluded its work in December 2005. IBESo comprises the following five research themes:

Theme:	Theme members:
Preliminary floristic inventory for RBIM and its buffer zone	Nelson Toval Ricardo Rueda Elvira Cotton
Use of plants and local knowledge in the buffer zone of RBIM	Alvaro Noguera Henrik Balslev
Incentives for stimulating sustainable natural resource management	Alfredo Ruíz
Social capital and its importance for strengthening local organization	Ligia Gómez Helle Munk Ravnborg
The environmental governance in El Castillo, 1999-2004	Mariana Barrios Rikke Jakobsen Broegaard

IBESo was allocated a total budget of DKK 2 million. This paper draws upon results from these IBESo research themes reported by Barrios and Broegaard; Gómez and Ravnborg; Noguera; Ruíz; and Toval and Rueda.

Preliminary floristic inventory of RBIM and its buffer zone

The objective of the research carried out within this theme was three-fold:

- to contribute to the knowledge about the biological diversity of the RBIM as well as of its buffer zone;
- to develop and test participatory methods by which to contribute to the knowledge on biodiversity as a means of stimulating the recognition among the local population of the biological values of RBIM and its buffer zone; and
- to explore mechanisms for generating economic benefits at the local level based upon the conservation of the biological richness of the zone.

In response to these objectives, IBESo has engaged in a process of identifying, training and supervising a group of 18 para-taxonomists, i.e. people living in the buffer zone. The para-taxonomist have collected and prepared samples of plants. For each sample, the para-taxonomists received a payment between US$ 0.3 and US$ 1 depending on the quality and rarity of the sample. On average, the para-taxonomist achieved a monthly income of US$ 50 during the period of collecting plants for IBESo (approximately one year). As the group of para-taxonomists included local forest guards, IBESo obtained permission from MARENA allowing the forest guard para-taxonomist to also collect plants in the RBIM itself, whereas the remaining para-taxonomist only collected plants in the buffer zone.

A total of 3010 samples were collected of which 2.796 have been identified to the level of species and the remaining 214 samples at time of writing have only been identified to the level of family or genus due to the absence of corresponding records in Nicaragua. Among these 214 samples it is therefore likely to encounter species which are new to Nicaragua or to science. The 2.796 samples so far identified to the species level correspond to a total of 953 species of which 252 species which were collected both in the RBIM and the buffer zone, 528 species which were collected only in the buffer zone and 173 which were collected only in the reserve. Of these species, eight had not previously been recorded in Nicaragua. Interestingly, four of these eight species were collected in the most populated parts of the buffer zone, namely around Boca de Sábalos and Laureano Mairena. In this light, the decision to orient the biological research undertaken by FUNDAR in preparation of the management plan for RBIM and its buffer zone exclusively towards the reserve itself seems questionable. Moreover, it accentuates the urgent need to develop a comprehensive management plan to orient natural resource management and the overall environmental governance within the buffer zone.

Apart from generating local recognition of the existing biological richness and local economic benefits, the advantage from a botanical point of view of having local para-taxonomists undertaking the collections is that it facilitates collection throughout the year whereas scientific expeditions usually take place during short periods of the year – and often during the drier periods of the year – which means that only plants flowering during these periods of the year get collected.

Use of plants and local knowledge in El Castillo

Despite the fact that El Castillo is a zone which continues to receive immigrants – 13% of the population has stayed in El Castillo less than five years (IBESo data) – a considerable knowledge and use of plants for various purposes was reported. During a questionnaire survey administered to a total of 133 individuals divided in 13 communities, a total of 398 plants were named as plants used. Each informant reported on average between 29 and 55 plants used for various purposes, depending on the community.

Not everyone perceives of RBIM and its buffer zone as a zone of high biodiversity

No matter how convincing such data might be to the national and international community of conservationists, they do not carry similar appeal to other and equally or even more powerful actors. Many see El Castillo as an area of cheap and ‘unused’ land, and cattle farmers who in the old agricultural frontier areas such as Nueva Guinea and Chontales perhaps only owned 25 acres are

able to increase their land holding up to a 100 acres in El Castillo using the proceeds from selling their land in the old agricultural frontier areas to buy land in El Castillo.

Another forceful actor is the timber industry. Legal exploitation of forest resources is expensive (costs for permits, pre-inspections, transport and time) and cumbersome, particularly to small-scale farmers, who perhaps just seek to utilize a couple of trees. On the contrary, due to the almost complete lack of control with respect to the actual exploitation and sale of forest resources – since March 2005, El Castillo has had one forest inspector (INAFOR), while previously most transactions including applications for permits etc. had to be presented in San Carlos – the costs of illegal timber production are very low. Thus, in order to control the actual utilization of forest resources and thus increase the costs of illegal timber production and reduce the costs of legal timber production, particularly to small-scale farmers, it is of utmost importance to significantly increase the ability of INAFOR to carry out its duties.

Economic incentives to promote sustainable utilization of natural resources in El Castillo

During the last decade, many projects and donor organizations have supported efforts to promote more sustainable production systems in El Castillo which would imply less pressure upon the forest resources. Such efforts include the current efforts supported by Danida to promote the production and marketing of organic cocoa. Moreover, a number of organizations have started to explore options and modalities for implementing payment for environmental services schemes, based upon services such as forest conservation and conservation of habitats e.g. for the *lapa verde,* in danger of extinction. It is still too early to assess the extent to which such schemes will be successful.

Fundamental to efforts of creating economic incentives to promote conservation and sustainable natural resource management is the fact that what to some farmers constitutes an economic incentive in favour of conservation, may not do so to others. Due to stark differentiation among farmers with respect to resource endowments (IBESo has developed a typology of farmers in the area), the opportunity cost of one acre of land is far from uniform. A small-scale farmer with no or only a limited number of cattle might find an annual payment of US$ 20 sufficiently attractive to keep him (or her) from cutting down the forest. By contrast, a farmer who has already established him- or herself as a livestock farmer with a steadily growing cattle herd is unlikely to find any annual payment below US$ 50 sufficiently attractive to keep him from converting forest into pasture or to be attracted to engage in cocoa production. While from a social point of view it is crucial to support small-scale farmers in ways which enable them to improve their livelihoods, from an environmental point of view, it is equally – and often more – important to find ways to change the natural resource management practices of resourceful livestock farmers. In cases where economic incentives are not sufficient, these have to be combined with measures of ‘punishment’ of unsustainable natural resource management, e.g. tax measures, and measures of prohibition and control, legally backed by a management plan for the RBIM buffer zone.

The importance of social capital for the local organization in El Castillo

A common goal of many conservation efforts in El Castillo and elsewhere has been as much as possible to seek the participation of the local population in the control and conservation of the protected area. Local involvement in the control of a protected area, however, to a large extent

depends upon commonly shared values with respect to the importance of conservation and the existence of trust and social coherence which enable a community member to reproach neighbours in case they are seen to undertake illegal or environmentally harmful activities without having to fear for violent acts of vengeance.

In order to understand the nature of social relations within communities, IBESo has conducted research to explore the nature and the constituting factors of social networks in four communities in El Castillo. Among the results of this research are that a significant proportion, particularly of men, are not known to other men in the communities, and that these 'unknown' men do not engage in any local organizations or committees. Some – but not all – of these 'unknown' men are newcomers while others engage in seasonal migration to Costa Rica. Due to the large distances between the different sectors of a given community and to high levels of mud to be crossed during a large part of the year to come from one sector to another and even from one house to the next, social relations – particularly between women – are not so frequent across sectors, i.e. at community level, but tend to concentrate within sectors. These features carry significant implications for interventions being introduced from the outside. Most institutions – be they projects or government institutions – tend to approach the local population at the community level and through community level organizations such as the community council or committee. However, due to the types of social relationships summarized above, this approach may only allow them to reach that specific segment of the community from which community council members are drawn. Our research shows that this segment is often restricted to a single sector of a community.

Moreover, violence and threats of violence are common incidences in many communities of El Castillo. In this context, most people seek to avoid creating animosity. Among the few examples of actions of social control encountered in the communities was the effort of one community to prohibit the consumption of alcohol in an attempt to control the number of violent conflicts in the community. No cases – and very low willingness – were reported in terms of reproaching others in case of illegal or unsustainable use of natural resources, particularly when such actions of social control could not be expected to be backed by public authorities.

The dilemmas of the 'frontline' environmental officers in the environmental governance

Environmental control is important to complement efforts of creating economic incentives promoting sustainable natural resource use and specifically as a means to increase the costs of illegal timber production, as well as to back actions of social control in the field of natural resource utilization. Notwithstanding the number and quality of strategies, directives and management plans developed for an area like RBIM and its buffer zone, effective environmental governance and control is inconceivable without a well-functioning group of frontline environmental officers whose task it is to advice people and to control and report on illegal natural resource utilization. Through interviews with frontline as well as with more senior environmental officers, a number of dilemmas facing the frontline officers became evident.

On average each forest guard in the control posts along the border of the RBIM is expected to control a stretch of 8 km of the border and an area of RBIM of 70 km^2. Given the character of the area and the type of equipment to their disposal, it is no surprise that blind spots exist along the border to the RBIM. Moreover, despite the presence of a soldier at each control post, the forest guards who live in the control posts for a continuous period of 22 days depend on the surrounding

population for food, social relations and personal security. With very limited equipment for documenting possible infringements and the high likelihood that a case of infringement reported by them will be 'dropped' at higher levels of the system, forest guards are likely to think twice before deciding to risk their good relations to neighbouring community members or even their personal security by reporting on possible infringements. Thus in order to ensure an effective environmental control, it is important to increase the capacity of MARENA to carry out frontline environmental control (number of forest guards and equipment to adequately document infringements), to ensure that reports made by frontline environmental officers are adequately treated at higher levels of MARENA, that information on the outcome of the legal process is adequately communicated to frontline officers, and finally that effective environmental control is complemented by effective control of forest exploitation (INAFOR).

IBESo publications

All IBESo publications are shortly available from www.diis.dk/ibeso. Furthermore, the research reports from each theme will be published through FARENA and Nitlapán publication series.

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