Community-based management in two biosphere reserves in Madagascar – distinctions and similarities: What can be learned from different approaches ?

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ABSTRACT

This article explores the socio-cultural aspects of community-based management of natural resources in Madagascar. The contractual devolution of management rights and responsibilities to local user groups constitutes an important instrument in the country's environmental policy. Its challenges and opportunities are investigated through a case study that scrutinizes two biosphere reserves: Mananara-Nord at the northeast, and Sahamalaza at the northwest coast of Madagascar. While Mananara is relatively well established, having successfully realized more than twenty management transfers, implementation in Sahamalaza is still in its infancy. Comparing both sites allows for drawing a picture of major factors that influence the success of this instrument. Data was gathered using a qualitative social research approach based on interviews and participatory rural appraisal. A conceptual framework integrating informal institutions and the concept of social capital was used to better understand socio-cultural dynamics within rural communities.

The paper presents the characteristics of both sites and explores traditional natural resource use, local associations, and their role in collective action, as well as customary institutional arrangements. The results provide insight into strengthening local management capacities and cooperation. They also highlight the need to leverage local knowledge and to reconcile the different formal and informal rules for active and responsible involvement of concerned community members in sustainable resource management.

RÉSUMÉ

En tant que nation, Madagascar qui est très diverse à tous égards, lutte pour se stabiliser politiquement. Au cours des dernières années, l'orientation des politiques environnementales semblait claire et poursuivait le but consistant à promouvoir l'utilisation durable des ressources naturelles afin de réduire la pauvreté tout en assurant le développement du pays. L'approche présentée dans cet article repose sur la gestion des ressources naturelles par les communautés rurales. Deux réserves de biosphère ont été retenues pour être considérées dans une réflexion sur les aspects essentiels qui influencent le processus de décentralisation au niveau local. Les processus de la gestion communautaire des ressources naturelles sont nettement distincts dans leur application entre la Réserve de Biosphère Mananara-Nord, située sur la côte nord-est du pays, et celle de Sahamalaza Iles-Radama, située sur la côte nord-ouest. Il existe cependant des conditions similaires qui permettent d'établir une comparaison et de présenter une image détaillée des transferts de gestion qui prennent place dans les deux études de cas.

Le transfert des droits d'usage et de gestion des ressources naturelles, lorsque l'État reste propriétaire, vise à augmenter la responsabilité de la population locale. Les terrains ainsi transférés sont surtout ceux qui bordent les Parcs Nationaux afin d'établir une ceinture verte dans laquelle les ressources seraient utilisées de manière durable pour satisfaire les besoins essentiels de la population locale. Dans le cadre d'un processus de transfert, un contrat est établi qui facilite l'allocation limitée des terrains aux communautés locales sous l'auspice d'une association civile.

Les conditions socioculturelles des deux réserves de biosphère étudiées sont analysées par le biais d'une méthode empirique de recherche en sciences sociales. Celle-ci est basée sur des interviews semi-structurées avec des gestionnaires des réserves, des représentants des résidents et des autorités, ainsi que sur la Méthode Accélérée de Recherche Participative (MARP) réalisée auprès des associations locales.

L'article présente le contexte et les caractéristiques des deux études de cas, repose sur l'utilisation traditionnelle des ressources naturelles, les associations locales et leur rôle dans l'action collective sur la conservation et l'éducation environnemental ainsi que les structures institutionnelles et les coutumes locales. Le concept de capital social est appliqué afin de permettre une meilleure compréhension des dynamiques socioculturelles des communautés locales concernées. Notre étude comparée permet de mettre en exergue des similitudes importantes entre les deux sites, malgré leur diversité, ainsi que d'identifier des approches de gestion intéressantes qui indiquent diverses voies pour améliorer leur situation. Nos résultats reflètent l'importance d'intégrer des règles formelles

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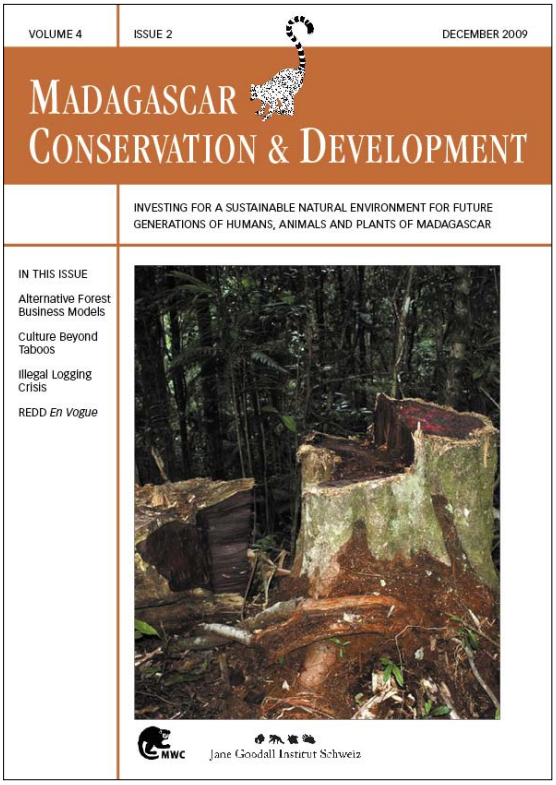

Madagascar Conservation & Development is the journal of Madagascar Wildlife Conservation (MWC) and the Jane Goodall Institute (JGI Switzerland). It is produced in these institutions' own responsibility.

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et informelles comme les *dina* et *fihavanana* (institutions informelles) dans l'utilisation des ressources naturelles, par exemple dans le contrat officiel de transfert de terrains. De plus les activités collectives de gestion favorisent une compréhension globale qui permet d'attirer d'autres membres de la communauté pour participer à l'effort collectif. L'étude détaillée de ces deux cas illustre clairement les enjeux et les occasions à saisir dans le transfert des décisions ainsi que les tâches à réaliser pour la décentralisation de la gestion des ressources naturelles à Madagascar ou ailleurs.

KEYWORDS: Community-based natural resource management, biosphere reserve, decentralization, informal institutions, local associations, Madagascar, social capital.
MOTS CLEF : gestion communautaire des ressources naturelles, réserve de biosphère, décentralisation, institutions informelles, associations locales, Madagascar, capital social.

INTRODUCTION

Madagascar, well known for its majestic natural beauty, finds itself in the midst of a struggle. After the coup d'état in March 2009, its political direction is unclear. Beginning in the 1980s, the government initiated Africa's first Environmental Charter leading to an ambitious and comprehensive environmental program, the National Environmental Action Plan (World Bank/Coopération Suisse/UNESCO/UNDP/WWF 1988). The Plan was given legal power in 1990 and has being carried out in three different phases, each lasting five years (Gezon 1997). The current instability of the government, however, threatens to set back these efforts towards sustainable development and conservation by years. Nevertheless, people involved in the management of these areas have demonstrated their willingness to continue with what has been established over the past few years. Building on such local confidence, our aim is to introduce interesting cases that demonstrate the implementation of community-based management concepts for the integration of nature conservation and development in a sustainable manner. In this article, we rely on the cases of two biosphere reserves: Mananara-Nord on the northeast coast and Sahamalaza Iles-Radama on the northwest coast. They apply different approaches, but have the same goal: The preservation of valuable ecosystems and the support of local livelihoods.

Madagascar has developed specific policies for delegating management rights for natural resources to local user associations. This kind of community-based natural resource management (CBNRM) is meant to foster local people's responsibility and raise their awareness of the value of conservation (Wainwright and Wehrmeyer 1998). In 1996, the first law on the co-management of natural resources was developed, the *Gestion Locale Sécurisée* (GELOSE). It is applicable to all natural resources and aims at better environmental stewardship through the establishment of local management entities, formal institutions, and empowerment. A central element of GELOSE is the contracts negotiated among the state (the forest authority), the municipality (e.g. the mayor), and a voluntary association of community residents, the *Communauté Locale de Base* (CLB) created for this purpose (Antona et al. 2004). For forests, a special legislation was formulated in 2001, *Gestion Contractualisée des Forêts* (GCF). The GCF process is a simplified alternative for the transfer of forest management rights to local user groups, called *Communauté de Base* (COBA) (Kull 2002, Raik and Decker 2007).

Currently, more than 450 GCF and GELOSE contracts have been signed throughout Madagascar (Raik and Decker 2007, GTZ and MEEFT 2008). Often, conservation and development organizations play a central role in designing management plans, zoning the areas, and providing technical support to the COBA/CLB. Although people receive the formal right to use resources in defined areas for their own purpose, the question remains how they can make use of the adjudicated resources to improve their livelihoods. As Salafsky and Wollenberg (2000) articulate clearly, "... having at least moderate linkage between the biodiversity and the livelihood activity, the strategy also requires that the project generates cash and non-cash benefits for the stakeholders and that the stakeholders have the capacity to take action to mitigate internal and external threats" (Salafsky and Wollenberg 2000: 1435).

The Convention on Biological Diversity (CBD), signed by the Malagasy government in 1996, confirms this sentiment. The implementation of the CBD supposes the involvement of all sectors of society in the conservation of biological diversity and sustainable resource use (UNESCO 2000). This idea is formulated in the vision of the biosphere reserve concept established by UNESCO's Man and the Biosphere (MAB) Programme. Currently, 553 sites in 107 countries have been declared as biosphere reserves (UNESCO 2009). These reserves have three inter-connected functions: (i) Conservation (landscapes, ecosystems, species, and genetic variation); (ii) development (economic, human, and culturally adapted); and (iii) logistic support (research, monitoring, environmental education and training) (UNESCO 1996). To implement the three-fold functions, biosphere reserves ideally consist of three interrelated zones: The core, buffer, and transition zone. The conservation efforts inside the core zone together with development activities in the buffer and transition zones are meant to attract the support of local populations living adjacent to the core zone.

Integration of local communities in management activities is an important objective in the two biosphere reserves where the implementation of community-based management has started. However, the status quo and the approaches differ between sites. In this article, we highlight similarities in both areas and contrast what has been achieved. Inspired by Pretty (2003), who depicted the theoretical developments of commons governance and social capital in relation to collective management of resources, we seek to link relevant factors with the concept of social capital. Thus, the focus is on the role and potential impact of cultural factors and social structures within the communities on the success of these initiatives.

CONCEPTUAL FRAMEWORK FOR UNDERSTANDING INFORMAL INSTITUTIONS. In contrast to the common use of the term 'institutions' as a synonym for 'organizations', institutions in this context are defined as rules of game, the "commonly understood rules and norms that stipulate what actions are required, permitted, or forbidden in particular situations" (Poteete and Ostrom 2002: 5). Organizations, on the other hand, are the "players of the game" (North 1994: 3). A distinction can be made between informal and formal institutions, the latter being legally recognized. Informal institutions are the traditions, customs, cultural norms, values, beliefs, and social behaviors, which also have great influence

on the structure and development of a society (North 1994, Williamson 2000). The New Institutional Economics analyzes the relationships and interdependences of institutions, the affected agents, and the resource base on which they depend (Paavola and Adger 2002). These societal relationships and structures are given special recognition in the concept of social capital, which is of particular relevance for this study. The most important introductory work on this concept has come from Bourdieu (1986), Coleman (1988), and Putnam et al. (1994). According to Putnam (2000), social capital refers to "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam 2000: 19). Social relations are, therefore, an outcome of reciprocity. He goes on to distinguish three categories: bonding, bridging, and linking social capital (High et al. 2005). Bonding social capital refers to ties between individuals with similar characteristics, such as family and close friends. Bridging capital designates more distant social networks and associations with individuals from a different social background but with shared interests. Linking social capital reaches outside the community across group boundaries and involves a vertical, hierarchical connection (Putnam 2000).

Social capital explicitly recognizes and analyzes informal institutions, and its potential to enable a better understanding of the informal processes is obvious. Formulating the three categories of social capital allows a comprehensive analysis of the interactions and relationships between groups and individuals at different levels as well as the nature of such relations (High et al. 2005). It thus offers the opportunity to examine a community's social orientation toward fragmentation (associated with strong bonding capital), cooperation (high bridging capital), and hierarchy and power structures (associated with linking capital). This conceptual framework is used as an analytical lens to better understand the social and cultural dynamics of rural community associations and their participation and performance in community-based management projects within rural villages.

METHODOLOGY

Our primary research question was "What are the conditions for community engagement in conservation and sustainable resource use in the two Malagasy biosphere reserves?" To answer the question from a socio-cultural perspective, we consider a qualitative case-study approach adequate. This allows for inter-subjective insight into the social reality of a particular situation (Flick 2007) that can be transferred to other cases with similar conditions and comparable challenges. For the analysis of socio-cultural aspects, a qualitative approach fits better than a quantitative one, as the latter seeks to abstract a unified set of principles from representative variables (Punch 2005). Generally, case studies are applicable for an investigation of crosscutting issues in as many different dimensions as possible (Denzin and Lincoln 2003). This requires openness and flexibility, which we achieved through a triangulation of perspectives (Flick 2008), i.e. (1) observation and interrogation from the point of view of two researchers, (2) application of different data collection methods, (3) investigation of two different sites, and (4) one site at two different points in time.

Data collected during two field visits in 2005/2006 (four months) and 2008 (six weeks) provide the analytical basis. During the first stay in the Mananara-Nord Biosphere Reserve, we gathered extensive insight into local conditions, cultural backgrounds, and management practices (Fritz-Vietta et al. 2008, Fritz-Vietta and Stoll-Kleemann 2008). We identified relevant stakeholders and key success factors for biosphere reserves, analyzing 64 semi-structured interviews (21 conservation and/or development professionals, 15 protected area managers, 28 locals) and 36 questionnaires filled out by all interviewees except the locals. We also undertook a comprehensive literature review. Analogue to the qualitative paradigm of a circular research process (Flick 2007), during the second stay, we focused on one of the key factors, i.e. community-based management. For the case study undertaken in 2008, we chose two study sites (Mananara-Nord BR and Sahamalaza Iles-Radama BR) to encompass different examples in comparable set-ups.

Through theoretical sampling, we determined whom to interview as well as the number of interviews necessary for relevant and comprehensive data (Glaser and Strauss 1967). Hence, interviews and meetings were undertaken with representatives of CLB/COBA of villages, which were in different stages of organization and GELOSE/GCF implementation, as well as with members of other associations, local authorities and farmers. Questionnaires were handed out to management staff of the Biosphere Reserves to gather information on collaboration partners and their point of view on community-based management. In the field, we conducted 35 semi-structured interviews of which ten were with experts, seven with management staff (four in Mananara, three in Sahamalaza), 18 with locals (six in Mananara, 12 in Sahamalaza).

In addition, we carried out field observation by visiting local villages (six in Mananara-Nord and seven in Sahamalaza) and traversing the areas' core, buffer, and transition zones. Participatory rural appraisal methods with 16 different local associations (COBA/CLB), women groups, Slow Food (representing farmers cultivating certified organic vanilla in the Mananara-Nord Biosphere Reserve, www.slowfood.com), and representatives of the platform *STRUCTURE* (in Sahamalaza) were applied. For two exercises, we chose a resource map (including the identification of particular forest values) and collaboration map, the former providing insights into the perception of local people's surroundings and the latter giving an understanding of the collaboration network among the actors involved. Where possible, we went on transect with the community members to understand their drawings. During enquiries among local people, communication was facilitated through translators. Ten expert interviews with conservation and development specialists provided an additional perspective on the issue. The analytic process was accompanied by several detailed literature reviews of both scientific papers and local reports and publications.

Interviews were transcribed verbatim, and the software ATLAS.ti facilitated the analytical process. Quotations cited in the article are drawn from this computer-based analysis. In the analytic process, we contrasted the theoretical concept of social capital with our findings in order to identify patterns and define cohesion.

CONDITIONS ON THE GROUND

CHARACTERISTICS OF THE MANANARA-NORD BIOSPHERE RESERVE. The biosphere reserve, designated by Presidential Decree 89/216 on July 25, 1989, is located on the

northeast coast of Madagascar. It is part of the Analanjirofo region and is situated 280 km north of the former provincial capital city, Toamasina. The total area encompasses 140,000 ha, including a strict conservation area comparable to the core zone of the MAB concept, which includes the remaining parts of the rain forest and coral reefs. This zone is officially categorized as a national park (Commission SAPM 2006) equivalent to International Union for Conservation of Nature (IUCN) category II (Dudley 2008). The 23,000 ha core zone comprises three massive primary forest blocks as well as a marine park of 1,000 ha surface area, including three islands (ANGAP/UE/IC 2005). The core area is surrounded by the peripheral or development zone – *Zone de Protection and Zone Périphérique* in the Malagasy terminology – in which the sustainable use of natural resources by the local population is permitted (see Figure 1). The buffer zone (according to the MAB approach) is now being established with the management transfer of forest areas located around the core zone. Overall, the ecosystems in the biosphere reserve are very diverse and include tropical humid forest, sandy coastal plains with littoral, and wetland vegetation, mangrove formations, marshlands, and coral reefs (UNESCO/ANGAP/DEC 2001).

Originally, between 1989 and 2002, the Mananara-Nord Biosphere Reserve was managed and financed by UNESCO. It was established as a conventional Integrated Conservation and Development Project (ICDP) with the aim to achieve nature conservation through the support of local livelihoods (Wells et al. 1992). Despite successes in economic development, the local population did not relate these development efforts with the ultimate goal of conserving their environment. Thus community-based natural resource management should refine the orientation toward a more integrated approach.

In 2002, the management of the Biosphere Reserve was assigned to the Madagascar National Parks (MNP) formerly known as ANGAP (*Association Nationale pour la Gestion des Aires Protégées*) and was funded by the European Union until 2009. Due to this European funding with a budget of more than twice the common average in developing countries (James et al. 1999), the management has been well equipped with a vehicle fleet, computers and radio communication. The staff input corresponds to the average in African countries (with 30.5 permanent, 20 for administrative support and four non-permanent employees) (James et al. 1999). The management includes three levels: (i) The coordination and administrative level, (ii) the conceptual and methodological level, and (iii) the operational level. Staff working in levels one and two are based mainly in the head office in the local capital, Mananara-Nord, while they work closely with the staff responsible for the execution of management activities (third level). The Biosphere Reserve is divided into five spatial sectors, each supervised by one coordinator (*Chef Secteur*), who regularly reports to the Biosphere Reserve director (level one). Rangers assigned to each coordinator traverse their sectors for several weeks at a time, carrying out awareness-raising activities and surveillance; they also try to reach very isolated territories. They meet regularly with their *Chef Secteur*. This sectoral approach reduces spatial distances to facilitate collaboration with local associations (Fritz-Vietta and Stoll-Kleemann 2008). Next to the prevalent conservation activities, the management focuses its development activities on support in agricultural productivities, local rural infrastructure, animal husbandry, handcraft and the advancement of women as well as the establishment of eco-tourism and the cultivation of certified organic vanilla as alternative income sources (ANGAP Réserve de Biosphère Mananara-Nord 2003).

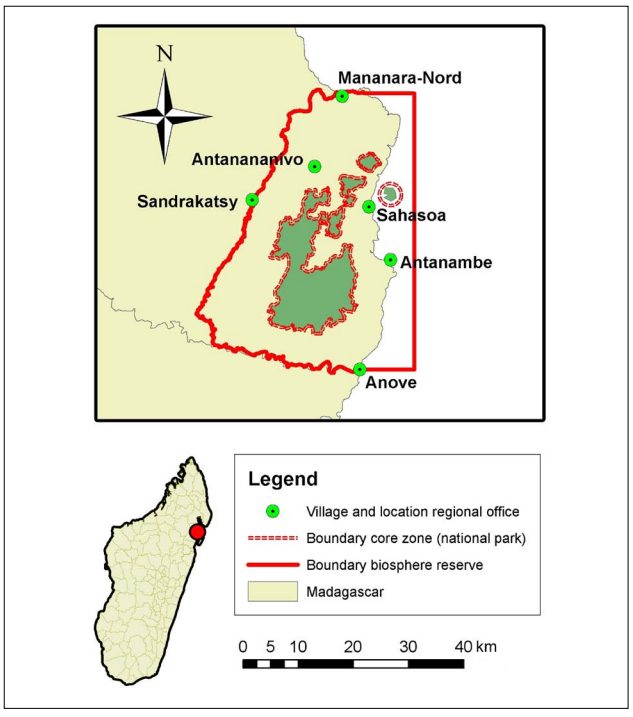

FIGURE 1. Mananara-Nord Biosphere Reserve.

CHARACTERISTICS OF THE SAHAMALAZA ILES-RADAMA BIOSPHERE RESERVE. The marine and coastal protected area Sahamalaza Iles-Radama was declared as a biosphere reserve by UNESCO in September 2001. Six years later, in March 2007, the core zone of the Biosphere Reserve was declared a national park within the national protected area network (Commission SAPM 2006), corresponding to category II of the IUCN protected-area classification (Dudley 2008). In 2006, Madagascar National Parks was officially designated to manage the area.

The Biosphere Reserve encompasses a total area of 153,200 ha (of which 26,035 ha comprise the core and buffer zone, i.e. the national park) including the Bay of Sahamalaza, which covers the Sahamalaza Peninsula and coral reefs and the Radama Archipelago, which is composed of four islands. It is situated at the northwest coast of Madagascar between the Bays of Narinda and Mahajamba in the south and Ampsindava and Ambanja – Nosy Be in the north. It covers five communes: Ambolobozo, Befotaka, Anorotsangana, Ankaramibe, and Maromandia. (SAVAIVO 2003, ANGAP and MEEFT 2008) (Figure 2).

The Biosphere Reserve was managed and co-financed by a consortium formed by the Wildlife Conservation Society (WCS) and the *Association Européenne pour l'Etude et la Conservation des Lémuriens* (AEECL) in collaboration with Madagascar National Parks (MNP) from its creation in 2001 until 2007, when WCS left the region. Today, the Biosphere Reserve (BR) is managed by three parties: The regional office of the environmental ministry *Direction Régionale de l'Environnement et Forêts* (DREF), the local MNP office in Maromandia, as well as the regional MNP branch in Mahajanga. The management staff of the national park (MNP Maromandia) is composed of a director, the head of the financial department, and two *Chefs Secteur*, whose tasks

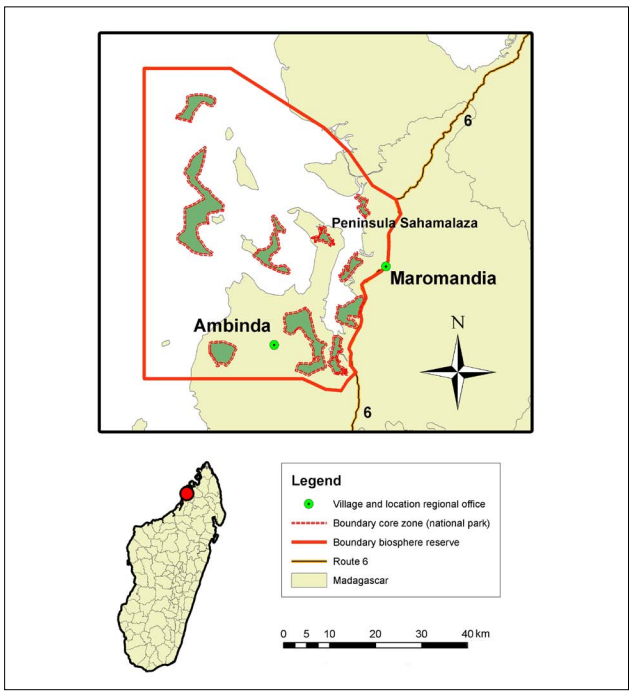

FIGURE 2. Sahamalaza Iles-Radama Biosphere Reserve.

are comparable to those described for the Mananara-Nord BR. The management does not employ its own rangers, but rather depends on assistance from local people, who are remunerated for surveillance services. AEECL carries out research and facilitates training on agricultural methods. The national NGO *Service d'Appui à la Gestion de l'Environnement* (SAGE), funded by the United Nations Development Programme (UNDP) and the Global Environmental Fund (GEF), installed in Sahamalaza in 2007 to support the implementation of the management transfer (ANGAP and MEEFT 2008). Its one-person office in Maromandia however, is underequipped and remains rather inactive.

Financial support is provided by GEF/UNDP, but is intended to run past in 2009. As a result of the political crisis, the funding has already been reduced to core activities of management and conservation. Negotiations to mobilize further funding after 2009 are currently under way within PNM. Inadequate facilities constrain the management performance as do the lack of stable electricity, basic infrastructure, electronic equipment, and means of transportation.

LOCAL PEOPLE'S INVOLVEMENT IN NATURAL RESOURCE MANAGEMENT

TRADITIONAL NATURAL RESOURCE USE AND CULTIVATION.

People are particularly dependent on the collection of natural resources in both the Mananara and Sahamalaza Biosphere Reserves. Forest resources are indispensible for house construction, carpentry, handcraft, basketry, and firewood. Canoes and the mortars and pestles used to grind food are made of wood extracted from the forests. Medicinal plants and fruits are used for health care and nutrition, as are some small animals such as the common tenrec (*Tenrec ecaudatus*) in Sahamalaza and the flying fox (*Pteropus rufus*) in Mananara. The principal marine resources exploited in Mananara are mussels, squid, and sea cucumbers and in Sahamalaza sea cucumbers, sharks, lobsters, and crabs. Whereas the use of forest resources is primarily for subsistence purposes, water resources are exploited for both personal and commercial use. Fishing is poorly regulated, and the encroachment of foreign fishing boats is to the detriment of local fishermen and the marine fauna. The absence of infrastructure and the difficulty of communication marginalize villages in both regions and can lead to an increase in illegal exploitation of natural resources. Moreover, local people are often forced to accept low prices by commercial traders.

In rural areas, most Malagasy households generally do not possess more than a small cottage, a small piece of agricultural land for cultivation, and – if they are relatively well off – a small amount of livestock. When not commercially exploited, livestock predominantly serve as security in times of scarcity. Cultivation for subsistence and the collection of natural resources provide the basis for rural livelihoods. Agriculture in Sahamalaza is rendered difficult by a chronic lack of water, the absence of a well-established and well-functioning irrigation infrastructure, and a dearth of flatlands that could be used for irrigated agriculture. Therefore, slash-and-burn agriculture, called *tavy,* is the dominant method employed. Typically, an acre or two of forest is cut, burned, and then planted with rice. After a year or two of production, the field is left fallow for four to six years before the process is repeated. The more often *tavy* is performed, the more the soil becomes exhausted of nutrients and the land likely to be colonized by scrub vegetation or alien grasses; the local name for this secondary vegetation is *savoka* (Erdmann 2003). On slopes, the new vegetation is often insufficient to anchor soils, making erosion and landslides a problem (Kistler and Spack 2003). However, the local population has been practicing *tavy* as a traditional agricultural technique over the centuries without having a markedly negative effect on biodiversity (Erdmann 2003, Raik 2007). Today, the increasing population contributes to the destructive effect of *tavy*, as the pressure on land has grown, cultivable land is limited and people are not able to wait for the soil to regenerate, with the result that they have increasingly turned to the exploitation of new, pristine areas.

In Sahamalaza, *tavy* is still practised on a considerable scale. Some local people appear to realize the negative effects of the practice, as it was explained by one villager, "Protecting nature was already in my mind, but the aggradations of our paddy fields come from the river of Monambaro, where there is a lot of erosion and landslides, favoring the aggradations of our paddy fields." (local resident, BR Sahamalaza, quote 26: 11).

Throughout the interviews with local residents, it became evident that *tavy* is not only a method for cultivation. It also has cultural significance, as it traditionally defines to whom a site belongs. Throughout Madagascar's history, land reclamation has been an informal process: A person is recognized as the owner of public land provided that it had not previously been cultivated by someone else (Jacoby and Minten 2005). Clan leaders called *fokonolona* represent traditions and customs such as the clan leadership structure and taboos (Tengö et al. 2007) and play a central role in land allocation. A local resident in Sahamalaza described the informal process: "After I arrived here, I went to the *fokonolona* and they gave me this land, and after an integrated occupation, I became the owner, and I could legalize it at the *fokontany*." (local resident, BR Sahamalza, quote 21: 29). Property rights have been neither precisely clarified nor codified. In Mananara *tavy* increased considerably since the beginning 1970s, when General Ramanantsoa liberalized land

tenure for appropriation through *tavy*. People clear-cut various primary forest patches to occupy as much land as possible (ANGAP-UE/IC 2005). Following the establishment of the Biosphere Reserve, however, deforestation by *tavy* has dropped significantly (cf. Conservation International/Ministère de l'Environnement, des Eaux et Forêts/USAID 2007). This is particularly noticeable in the core zone, i.e. the national park, where monitoring demonstrated the absence of *tavy* in the last few years. An associate of the management explained, "The flyover (…) confirms that there is no *tavy* anymore. Our technical consultant was very sceptical before looking at the pictures [and asked] 'Are you sure that there is no deforestation anymore?' because our reports state that the deforestation has stopped. But after looking at the photographs, he [the consultant] confirmed [that our observations were correct]." (staff member, BR Mananara-Nord, quote 41: 1).

In Sahamalaza many *Communauté Locale de Base* (CLB) members who are convinced of the need to protect their remaining natural resources complained about the tendency of others to be ignorant and only interested in their own well-being and not in that of the whole society. One person explained: "Those who do not want to become member of the CLB are still the majority. (…) They only look for their individual interest but not for the society's. And then they say, 'I will do this, even if the CLB does not give me the permission to clear the forest. I will go to the *Chef Cantonnement* and I will do what I want to do.' And the law so far does not stop him." (local resident, BR Sahamalaza quote 20: 37).

In both biosphere reserves, most of the land is officially state property. Two approaches are applied to overcome the unregulated occupation of land and the use of natural resources. First, the Malagasy government, in collaboration with MNP, developed the national protected areas legislation *Code des Aires Protégées* (COAP) (latest version from November 2008, which yet remains unsigned due to the political struggle). This law defines specific zones – a buffer zone (*Zone d'Occupation Contrôlée* (ZOC) and a *Zone d'Utilisation Contrôlée* (ZUC)) surrounding the core zone – in which controlled resource use is permitted to reduce human-induced pressures on protected ecosystems. Both biosphere reserves include ZUC in their zonation, whereas ZOC is not applied since there are no permanent settlements in either of the two national parks. Secondly, in line with the transfer of resource management according to *Gestion Locale Sécurisée* (GELOSE) policy, the decree called *Sécurisation Foncière Relative* (SFR) comes into force in order to enhance tenure security (Decree n° 98-610 of 13 August 1998). It involves a property-rights registration process that defines boundaries for formally allowed resource use, though it cannot be considered as proper cadastre (Belvaux and Rabearisoa 2006). In practice it has been barely applied mainly due to lacking competencies (Resolve Conseil/PCP/IRD 2005). The SFR decree is not part of *Gestion Contractualisée des Forêts* (GCF) policy as to simplify the implementation process (Hockley and Andriamarovololona 2007).

The Sahamalaza Biosphere Reserve is the first protected area with core zones in the ocean. Non-local fishermen from the nearby island Nosy Be pose a threat to the marine resources through illegal fishing. Therefore, the intention is to include marine segments in the transferred lots through the GELOSE policy in order to formalize co-managed zones. In Mananara, forest use is formalized through the GCF policy. The terrains are located around the core zone and function as a 'green belt' for regulated resource use. While in Mananara most of the planned terrains have been transferred, in Sahamalaza the official process has not yet started.

THE ROLE OF LOCAL ASSOCIATIONS. To apply GCF and GELOSE policy, either two or three legal bodies, respectively, are required to sign the contract with the local grouping, which must clearly regulate the rights and obligations associated with the access to natural resources (Antona et al. 2002). A premise is that the local residents establish a legal entity in the form of an association to represent the community as a juridical person in any agreement with the government and local authority representatives. The result has been the formation of the *Communauté locale de base,* COBA (as they are called in Mananara) and the CLB (the abbreviation in Sahamalaza).

According to article 3, act 96-025, an association is "a voluntary grouping of individuals united by similar interests and obeying a common code of life". Officially, its mandate is that of a non-governmental organization (NGO) (GTZ and MEEFT 2008). Next to COBA and CLB, which are central to the decentralization process, other groups exist in both regions that represent accumulated interests. An example is the *groupes de femmes* (women's groups). In the Mananara region the groups are represented by women committed to local improvement who worked with Madagascar National Parks (MNP) to establish lodges for eco-tourists. We were hosted there for two days and experienced the women's engagement and personal involvement in their project. In addition to eco-tourism activities, they engage in social work, support school rehabilitation, and conduct AIDS-prevention activities. Men, too, participate in women's groups and are always welcome, as long as they accept the organization's rules. In Sahamalaza, the women groups are inter alia engaged in the organization of ceremonies and celebrations of environmental events, which they plan in collaboration with several green associations (including CLB).

Every year, the associations arrange events such as the World Environment Day (5 June) and the *fête des lémuriens* (26 September). The target groups are local villagers, children, and local authorities. Financially and technically supported by MNP, Wildlife Conservation Society (WCS) and *Association Européenne pour l'Etude et la Conservation des Lémuriens* (AEECL), activities like folk dance for women, sport matches for children, and poetry for everyone are offered. At the center of these activities is the sensitization with regard to reforestation programs and the change of behavior with respect to *tavy* (ANGAP 2008).

Another interesting example in Mananara is called Slow Food, an association of small-scale farmers who cultivate organic vanilla. In the course of the Biosphere Reserve's operation, this certificate of a European NGO was introduced to develop a local market for organic vanilla. The association has recorded exceptional growth in its membership, which reached 586 members in 20 different villages registered in 2007 (Association des Planteurs de Mananara/Intercoopération Madagascar/Parc National Mananara–ANGAP/Fondation Slowfood pour la Biodiversité 2008). People recognize the advantages of being a member and are grateful for technical support and the promotion of the label, but also for the chance to communicate their experiences at regular meetings. Training programs are being provided, although members complained that the frequency is still insufficient.

Whereas in Mananara the COBA work mainly independently of each other, having only occasional meetings, in Sahamalaza

an interesting concept is applied in order to foster mutual learning and knowledge transfer. A platform called the *STRUCTURE de concertation* has been established in every commune that is part of the Biosphere Reserve. These *STRUCTURES* are of formalized, official character with constituted rules and procedures (ANGAP 2008). Figure 3 illustrates the assembly of the *STRUCTURE* Moramandia (blue) and its collaboration partners (local authorities and NGOs). *STRUCTURE* allows for the coordination of various associations in order to pool those who want to manage forest and marine resources (SAVAIVO 2003).

Another instrument for the coordination of all CLB in the Sahamalaza Biosphere Reserve is a federation (*Fédération*). The president of the federation is responsible for awareness-raising activities and represents all CLB in public affairs. He also looks for partners and settles conflicts between CLB and other actors. CLB presidents meet him three times a year for inter alia training activities, which are then distributed within the associations. *Service d'Appui à la Gestion de l'Environnement* (SAGE) and NGO staff, for example, give lectures on management and sustainable resource use methods to the presidents of *STRUCTURE,* who in turn pass their new knowledge on to other members. Interestingly enough, most of the presidents are of cultural or political rank. For example, the president of *STRUCTURE* in Maromandia is member of the royal family of the region.

LOCAL INFORMAL INSTITUTIONS AND CULTURAL FACTORS.

A well-known informal institution is called *dina*, which is, traditionally, an oral code of conduct that governs relationships within and between communities. A specific instance of application of the *dina*, however, can also be formulated as a written document and then made public (Rakotoson and Tanner 2006).

The term *dina* refers to a system of local rules and regulations used to guide and control community behavior, including resource use. Under GELOSE and GCF, relevant aspects of the *dina* are formalized and integrated into the contract between the community association and the official agencies. This should help to establish and monitor the rules negotiated and fixed in the contract.

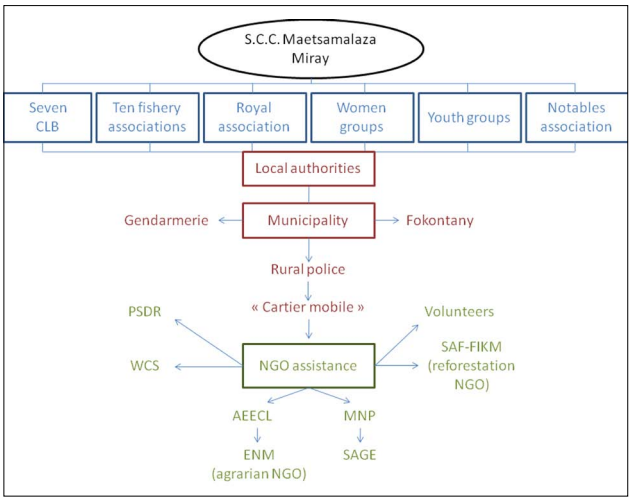

FIGURE 3. Assembly of the *STRUCTURE* Maromandia (blue) and its collaboration partners – local authoritities (red) and non-governmental organizations (green) (translated drawing by representatives of S.C.C. Maetsamalaza)

Abbreviations:
PSDR: Projet de Soutien au Développement Rural; WCS: Wildlife Conservation Society; AEECL: Association Européenne pour l'Etude et la Conservation des Lémuriens; MNP: Madagascar National Parcs; SAGE: Service d'Appui à la Gestion de l'Environnement

The *dina* can be used to regulate a wide range of issues and to solve conflicts, especially in remote areas. It is an informal legal mechanism that also stipulates fines (called the *vono dina*). Within its broad range of applications, and of specific relevance to the present discussion, the *dina* provides security over land-use practices and access to natural resources.

In an attempt to harmonize the control mechanisms of the GELOSE/GCF contract, they are incorporated in a *dina* document and the management plan. Furthermore, the responsibilities of the contract are included, involving sanctioning and monitoring activities of the CLB/COBA for the transferred resources. This ensures its acknowledgement as a legal institution with regard to resource use. The *dina* has to be published by the local mayor in order to reach official and public acceptance (Sörensen 2005). The detailed design and content of the *dina* document is negotiated and fixed during meetings of the COBA/CLB members.

In both regions, the application of the *dina* by COBA/CLB members to punish offenders of the agreement remains a challenge. While in Sahamalaza the problematic is the inadequate elaboration and implementation of the *dina*, in Mananara the foremost problem is its incompatibility with the social phenomenon of *fihavanana*. Although the *dina* have traditional legitimacy and relevance to local people, there is a risk that newly developed *dina* are perceived as externally defined and imposed rules, which do not correspond with local visions and ambitions (Keller 2009). Sahamalaza, having only relatively recently applied GELOSE, is still revising and formulating the relevant aspects of the *dina*, both on the communal and inter-communal level. In fact, the management transfer is not yet official, leaving the CLB without the legal authority to apply sanctions against delinquents. Furthermore, respondents interviewed stated repeatedly that applying the *dina* is difficult because every *fokontany* has its own local interpretation of the *dina*. A person who exploits the forest outside his own village boundaries does not feel obligated to comply with the rules of the other village. This is especially problematic when the *dina* interpretation of the two villages have different regulations concerning resource use. Conflicts may also arise when the external 'offender' is simply not aware of or has no knowledge about these differences.

CLB representatives perceive the protection of the forests to be impossible without a legally binding, detailed rendition of the *dina*. In an effort to harmonize the differences between the local interpretations of the *dina* (called *dina fototra*), the general assembly of the CLB has initiated a project to establish an inter-communal version, termed *dina kaominaly*, which would be applicable for the whole region. However, whereas the *dina fototra* are usually respected and agreed upon, the *dina kaominaly* often have less legitimacy and reflect top-down priorities, which weaken their authority and acceptance at local level (Kull 2002). All CLB and *Chefs de Fokontany* are involved in the elaboration of the *dina kaominaly*, and most CLB members stress its importance for the collective solution of the problem.

This inter-communal initiative is costly in terms of time, resources, and the general effort required to build consensus. Accordingly the process has not yet come to an end. Legally codifying the *dina* and implementing GELOSE in Sahamalaza is also constrained by a form of linking social capital, which has been stressed by almost all residents. To paraphrase one observer, the main problems with regard

to the *dina* and the management transfer are located at doorstep of the technical state service and the elected authorities because there is an inherent conflict of interest when the transfer is accomplished: namely, the technical service will lose its power. Complicating things further is the fact that the authorities are subject to manipulation by those looking to gain personal advantage.

"If the CLB manage their resources independently, the *Chef Cantonnement* and the *Direction Régionale des Eaux et Forêts* (DREF), will lose their power and personal advantages. So they destroy the forest before the transfer is realized, because afterwards, it will not be possible any longer." (local resident, quote 20: 20). This perception touches a range of issues, including corruption and the inherent problem of any decentralization process: The redistribution of power. Currently, the *Chef Cantonnement* supervises logging permissions, receives fees and relinquishes contracts or fines – all of which will be transferred to the CLB. It also illustrates the willingness of CLB members to manage their forests accountably and their frustration because their empowerment is still inhibited.

In Mananara, the problem of applying the *dina* is closely related to another social cornerstone of Malagasy society: The *fihavanana*. While the *dina* are called the "cement of Malagasy society" (Jones et al. 2008), the *fihavanana* is a system of horizontal solidarity. Dahl (1993) explains: "The root of the word is *havana*, which means parent/kin/lineage. (...) *Havana* is also used as honourable term. To be called a *havana* means that one is accepted as a family member. *Fihavanana*, therefore, means kinship, but also friendship, solidarity, readiness to help, good relationship. This meaning is expressed through many proverbs, such as "It is better to lose wealth than to lose *fihavanana*" (*Aleo very tsikalakalan-karena toy izay very tsikalakalam-fihavanana*)" (Dahl 1993: 100).

In Mananara, these strong relationships complicate the application of *dina*. "The *fihavanana* states that the *dina* should not be applied. There is some sort of contradiction between them. The *dina* determines that if someone exploits the forest without having made the demand, he will have to pay a fine, whereas the *fihavanana* says that the issue should be dealt with amicably. Concerning the transfer of forest management, the *fihavanana* forbids applying the *dina*. This means that the *fihavanana* is a tool to invalidate the *dina*." (staff member, Mananara-Nord BR, quote 29: 26). In other words, families who dislike the rules of the *dina* use the spirit of the *fihavanana* to disobey them.

Due to this manifest contradiction between the *dina* and the *fihavanana*, COBA find it difficult to protect their forests against offenders because they often have relatives or friends in the same village. As a consequence, their illegal exploitation is tolerated in order to maintain social harmony. This observation has been confirmed by several respondents.

When asked for solutions, the possibility to harmonize between the *dina* and the *fihavanana* is linked to the motivation and attitude of the local people and their willingness to cooperate. "There are those who want to make their fortune by manipulating the *fihavanana* in order to disable the *dina*. For those who are motivated and willing to collaborate, it is possible to combine the *fihavanana* and the *dina*. But those who are not benevolent will use the *fihavanana* to disable the *dina*. If he [the offender] is affected by the *dina* governing the issue, he talks about the *fihavanana*." (staff member, Mananara-Nord BR, quote 29: 27). Although this problem was not mentioned in particular in Sahamalaza, MNP employees affirmed that the problem is not only limited to the Mananara region.

According to the Malagasy philosophy, nothing happens by chance. Social norms are built on a strong mesh of specific taboos and traditional patterns of behavior. Taboos are grouped under the term *fady* (Box 1) and have great impact on forest utilization, agriculture, and fishing activities. There are certain days that are *fady*, meaning, for example, that snorkeling is forbidden on Thursday in Sahamalaza, and that it is not allowed to cultivate rice fields on Tuesday, Thursday, and Sunday in Mananara. When asked about local customs concerning natural resources, it is the *fady* that is mentioned most often and referred to as the traditional way of resource management, a sort of "automatic conservation" (local resident, quote 20: 34). "Yes, the custom is a system to protect the environment, for example the *fady*. (…) Because if a certain area is *fady*, it is impossible to enter it. There are also animals that are *fady*, and it is forbidden to eat them, such as the lemurs, the eagles, the wild pigs, …" (local resident, Sahamalaza BR, quote 27: 25).

Both biosphere reserves include sacred places where it is strictly forbidden to cut trees and to exploit resources, each having its own history and associated traditional rules. In general, these areas are located within the remaining splits of the natural forest. However, although these traditional norms are largely respected, the younger generation no longer maintains traditional norms absolutely. Due to an individualization process and the strong influence of Western culture in recent years, especially in the context of land-reclamation and agriculture, traditions are being increasingly ignored (Raondry et al. 1995).

With regard to traditional hierarchies and cultural power relations, another interesting feature is the local royal family, the *Ampanjaka*. The region is part of the northern realm of the *Sakalava* queen, whose palace is located in Analalava (ANGAP and MEEFT 2008). The role of the monarch is illustrated in the following statement of one CLB resident: "The king has no function or responsibilities, but he is there to respect the tradition/custom …. He is the liaison between the Lord and the people (…) The word of the king is respected by the people. He is helpful in transmitting the message of the protection of the

BOX 1: *FADY*.

Taboos regulate life in the community and establish norms for what is prohibited or allowed. Some *fady* refer to places; some can refer to people (Dahl 1993). "To respect *fady* is to respect world order. *Ota fady*, to break *fady*, is dangerous. You will have *tsiny* [blame] and most probably be hit by tody, the retaliating force (...). Disrespect might block communication. Taboo-breakers are a disgrace to their home and community, as they bring the whole community out of the normal status and into a dangerous position." (Dahl 1993: 79) Dahl gives various examples of land-use projects that have failed due to a lack of respect or knowledge of local *fady*. For such projects to be successful, understanding local customs is essential, as *fady* on land can also be lifted.

environment because then, people cannot refuse. He has a lot of power." (local resident, BR Sahamalaza, quote 18: 40).

In Sahamalaza, the prince of Maromandia was very supportive when the Wildlife Conservation Society (WCS) and *Association Européenne pour l'Etude et la Conservation des Lémuriens* (AEECL) started the initiative to establish the protected area. However, when he realized that the envisioned protection zone would include part of the mangroves that he personally used for exploitation, he started to oppose the activities, according to an environmental consultant of the Sahamalaza BR. His opposition led to reduction of the population's acceptance. The situation turned again when a change of one of his ministers led to the prince once again displaying a more favorable attitude. His sister (a princess) holds a very supportive attitude towards conservation, having a close relationship to one of the *Chef Secteur*. The princess is also president of the *STRUCTURE* in Maromandia. Furthermore, the royal family also has duties, as pointed out by the local *Chef de Fédération*, who is himself a prince: "The mandate of the king is unlimited, but it depends on his health condition. He can also be deposed as a result of his behavior towards the population. The king also has to follow the rules." (quote 21: 19).

SOCIAL CAPITAL AND LOCAL INSTITUTIONS

Various factors have been presented that are associated with community-based natural resource management in both biosphere reserves. Pretty (2003) named conditions necessary for effective participation of local associations or groupings in resource management:

- Good knowledge about local resources
- Appropriate institutional, social, and economic conditions
- Processes that encourage careful deliberation

Common rules, norms, and sanctions are meant to be the drivers that ensure complementarities of group interests with individual needs (Pretty 2003). In Malagasy rural societies, cultural values and everyday life are closely interlinked with the environment.

THE ROLE OF SOCIAL CAPITAL IN COMMUNITY MANAGEMENT. Analyzing informal institutional systems and the social capital of Malagasy rural communities helps to better understand local dynamics and the occurrence of collective action. Both biosphere reserves show all three types: Bonding, bridging, and linking social capital. Community engagement in both regions depends to a large extend on the local informal institutions and their relationships. In Table 1, we list dominant institutions that characterize the social capital of local people in both biosphere reserves.

Bonding social capital: *Fihavanana* clearly shows characteristics of bonding capital, which refers to strong social ties between people with common demographic characteristics, such as family (Dahal and Adhikari 2008). The cultural identity and norms associated with *fihavanana* have great influence on the behavior of groups and individuals within communities in both positive and negative ways. On the one hand, these bonds can facilitate collective action, as it fosters mutual dependence, trust, and reciprocity. In addition, shared norms can promote conservation by prohibiting certain actions (*fady*) and by promoting cooperative decision-making (*dina*) (Agrawal and Gibson 1999). On the other hand, the traditional norms and strong personal relationships and solidarity are often used in favor of elites (Dahal and Adhikari 2008). This becomes especially obvious with regard to the traditional hierarchy and the role of the royal family in Sahamalaza. Those in a traditional leadership position such as the local kings and princes are likely to be dominant and exploitive for their own advantage. Their support, however, can trigger positive incentives for resource conservation and can function as mediation between the other types of social capital.

Bridging social capital: The collaboration between associations can enhance bridging capital, as it helps to create networks of collaboration and interactions between non-homogenous groups. Local associations are not only a major part of the decentralization policy; they also play an important role in bringing people together and in creating a favorable environment for collective performance.

In regard to the complexity of the management transfer and decision-making processes, it is essential to identify the motives behind local people's participation and the ways in which responsibility and engagement for the environment can be promoted (Agrawal and Gibson 1999, Stoll-Kleemann and Welp 2006). According to Ascher (1995), a community is composed of individuals who share particular characteristics. Associations represent the common interests of its members and stimulate shared visions through, e.g. joint activities, as can be seen with regard to the work of the women groups. Their organization of the celebrations for the 'Environmental Day' is very successful and popular. Members of associations can actively push their concerns and more easily achieve their (common) objectives. The progress made by Slow Food illustrates the power local groups can generate and how their co-operation results in successful activities and benefits for all.

Decreasing respect of traditional norms, however, can have a negative impact, as it often leads to inadequate acceptance of the CLB and indifference or even opposition towards new processes and initiatives undertaken by the associations. When people do not respect social values and common informal arrangements, individual action is more likely to succeed. Here, the importance of the local association president's qualities and reputation is apparent since he/she frames the association and is responsible to provide impulses for common action.

The coordination of CLB by the umbrella association *STRUCTURE* in Sahamalaza facilitates a network of knowledge exchange and offers a common ground for discussing problems and experiences, thereby enhancing valuable bridging social capital.

Linking social capital: Linking capital involves relationships on the vertical level, which can result in power structures' unfair exploitation of the situation and other types of corruption. Especially in Sahamalaza, the GELOSE implementation process has stagnated due to issues at the higher administrative level. According to most interviewees, it is the *Chef Cantonnement* who is blocking this process. He is in charge of issuing permissions for forest exploitation; should this responsibility been shifted to the CLB he might lose power and income opportunities. This and the traditional land allocation through *tavy* both refer to linking capital. An implementation of either GCF or GELOSE policy and – in terms of the national parks – the implementation of COAP policy empowers local associations both to reduce centralized power

TABLE 1. Contrasts in the social capital of the biosphere reserves.

Biosphere reserve → / Social capital ↓	Mananara-Nord	Sahamalaza
Bonding capital	*Fihavanana* (relationships and solidarity between family and kinship) *Fady* (shared norms and values/beliefs/taboos) Informal *dina* (on village level)	*Fihavanana* (relationships and solidarity between family and kinship) *Fady* (shared norms and values/beliefs/taboos) Informal *dina* (on village level) *King* (spiritual leader)
Bridging capital	Green associations and their organized activities COBA – management and use of transferred forest areas Slow Food – income generating activities Women's groups – social and environmental engagement Fishery associations – traditional fisheries	Green associations and their organized activities CLB – management and use of transferred forest and marine areas Fishery associations – traditional fisheries Women's groups – social and environmental engagement Royal association Youth groups Association of notables Coordinating umbrella associations (*STRUCTURE*, *Fédération*)
Linking capital	*Tavy* (informal land allocation) GCF (devolution of power, transfer of forest management-fomalization process) COAP (defined utilization zones for sustainable practices – ZUC, ZOC)	*Tavy* (informal land allocation) GELOSE (devolution of power, transfer of natural resource management – formalization process) COAP (defined utilization zones for sustainable practices – ZUC, ZOC) Inter-communal *dina* (network building between village-level and communal *dina* – harmonization)

and to influence interpretation of informal property rights. Another aspect of linking capital can be seen in Sahamalaza, where local village-level *dina* are to be developed in order to fit with the overall communal *dina*. This opens the *dina* regulations beyond the community-level and introduces a vertical dimension. Moreover, the harmonization and integration of the various local *dina* establish connections between communities, which contributes to bridging capital.

DISCUSSION

The data collected during field investigations suggest that there is enormous potential for the management transfer to empower local people and promote their participation in local associations. However, whether this potential can be fully tapped depends on several key factors.

Comprehending and effectively using socio-cultural dynamics within communities to enhance local engagement in conservation requires a wide range of (intra-cultural) social competencies, including empathy, patience, and commitment. One of the most critical success factors is the reinforcement of local capacities, especially those of local associations, but also of rangers and management staff. Regular training to improve management capabilities is essential for local associations to establish themselves as well-functioning and persuasive entities. The *Chefs Secteur* usually have a good relationship with local people, and their commitment and familiarity with the area is essential to involve local people. However, sufficient training and equipment is a prerequisite. In Sahamalaza, the lack of basic equipment poses major constrains to management performance.

Providing a secure environment for planning and collective activities is another central consideration. Recurring events and a shared vision for a common future create a sense of collectivity and reciprocity. This requirement must be accompanied by appropriate incentives such as access to markets like with Slow Food, and the participation in social events to attract those who are not yet convinced.

Developmental programs and interventions of MNP and other actors such as SAGE and AEECL play an important role in this process. However, their activities need to be well coordinated in order to prevent frustration. In 2007, WCS and AEECL initiated many activities in Sahamalaza that subsequently had to be terminated. As a consequence, the local people became disillusioned and returned to their old habits. In Mananara, locals got used to the developmental support that started during the Integrated Conservation and Development Project (ICDP) phase and continued in the following years when the project had adequate funding. As finances have recently become insecure, developmental activities were reduced, yet locals still demand greater support. The outcome remains to be seen.

Furthermore, it is important that user associations gain management rights from the state in order to legitimize the local property right regime because formal state recognition validates user rights. State recognition increases tenure security and creates greater incentives for users to participate in management and to invest in the resource

(Meinzen-Dick et al. 2004). The zonation in biosphere reserves allows for clear allocation of terrains, in accordance with the designated buffer zone and *Zone d'Utilisation Contrôlée* (ZUC). A positive example of this is the implementation in the Mananara-Nord BR in the form of a green belt.

In Sahamalaza, however, the absence of state recognition of GELOSE is one of the major problems of the CLB and inhibits the effective application of the *dina*. Therefore, the acknowledgment of their rights creates the basis for a more egalitarian relationship among all stakeholders and can contribute to better service relationships in natural resource management. Because there is no formal land register, the traditional way of land reclamation by *tavy* is still common practice, which in turn can lead to major socio-economic problems. An example is the tensions that arose when the protected areas were established because many farmers were forced to leave farmland of which they felt themselves to be the 'real' owners. It is necessary to go beyond the dualistic opposition between 'formal state law' and 'local customary law' to reconcile contradictions between the informal rules-in-use and the formal rules.

CONCLUSION

This study affirms the importance of the management transfer as a tool to transfer property rights and thereby enhance tenure security and sense of responsibilities for collective action. It demonstrates the potential of local customs and traditional social systems to influence the success of collective resource management.

We showed that the institutions investigated are partly incompatible and even conflictive. However, considering these social and cultural relations as a resource that can facilitate access to and management of other (inter alia natural) resources sheds light on their instrumental value. Meaningful integration of the different customs and informal 'rules-in-use' as well as their harmonzation with formal state regulation is essential for collective resource management. All forms of social capital discussed above, can influence collective action in both positive and negative ways. Increasing local responsibility and political legitimacy is vital in this respect. Understanding and considering traditional administrative hierarchies along with power relations help to prevent conflicts and reconcile local sensitivities.

When contrasting the Mananara-Nord and Sahamalaza Biosphere Reserves, the types of social capital seem to have different levels of importance for the implementation of GELOSE / GCF. With respect to the management transfer, the need for a long-term vision and continued investment is obvious. Empowering and stimulating engagement in conservation requires a change of attitudes and behavior – which takes time. In Mananara, the COBA have recently been evaluated successfully, and their contract extended for another ten years. This opens up long-term incentives and builds on the confidence in local people's work.

Especially the context of biosphere reserves, where many different actors convene, dialogue is of particular importance. The two Malagasy biosphere reserves could benefit from a mutual exchange; so far, communication between them is virtually non-existent. A dense network of relationships should go beyond local structures and become common place.

ACKNOWLEDGEMENTS

We thank Madagascar National Parks for collaborating with us and providing facilities and information, in Mananara-Nord especially: Willy Mora (Director), Thierry and Narcisse (*Chefs secteur*), and in Sahamalaza: Isaia Raymond (Director), Urbain and Tsara (*Chefs secteur*). We are grateful to the Robert Bosch Stiftung for funding the GoBi research project within which this study was conducted and the Tierschutz-Stiftung Wolfgang Bösche for additional funding. We also thank Nele Leiner, Cristina de la Vega-Leinert, Mike McLoone, Vadim Michailov, all interviewees and last but not least the three anonymous reviewers for their very valuable comments.

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