

Local management of forest in southwestern Madagascar: Why do local management plans sometimes work without economic benefits?

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Introduction

Of the world's total forest cover 77 % is administered by governments, 12 % by individuals or firms and 11% by communities (White and Martin, 2002: 7). Estimation on the share of communities could be in the high end; another source arrives at a figure of only 5 % of the community part of total world forest cover (Siry et al., 2005: 556). An average forest environmental income per rural household of 22 % in total income has been estimated by a World Bank financed team based on 50 case-studies (Vedeld et al., 2004). The World Bank assumes more than 1 billion people depend to a varying degree on forests for their livelihoods (World Bank, 2001).

Breaking partly with the colonial and post-colonial public domain model of national parks (Gurung et al., 2005), community forestry in Madagascar sets out a precedent for decentralized resource management. It is a core element of the third National Environment Action Plan (2003-2007). GELOSE (Gestion Locale Sécurisée) is the legal vehicle for community forestry in Madagascar (contract signed between forest department – municipality – basic community). Community forestry, based on user rights through a management transfer from the Ministry of Water and Forest, has become one of the basic principles of environmental policy in Madagascar¹.

Because community forestry is complicated in its institutional setting and because it ultimately aims at satisfying three objectives: ecological sustainability, economic efficiency and social equity, most studies end up using single-case studies and single disciplinary approaches. On top, few variables are analyzed in any of the studies (Pagdee et al., 2006). Our focus in this research project is to favour a multiple disciplinary approach (see below), and to look at many variables though the research project is once again virtually a single-case study: south-west Madagascar.

Background

Originally, our point of departure was to examine:

‘Has the implementation of GELOSE in south-western Madagascar led to any improvement in economic output (efficiency), equity and ecological quality?’

- 1) Compared to the situation before (base-line study from 1998/1999)
- 2) Compared with communities not having signed any GELOSE contract’

¹ Since 1996 when community forestry became law, not a single management plan has been negotiated outside aid project intervention and funding

Hypotheses:

- 1) Deforestation takes place even in zones where the transfer of management of forest resources has been achieved.
- 2) Rules negotiated on the utilization of forest resources prior to signing a GELOSE contract are always reinterpreted by local stakeholders.
- 3) Local community management evolves with respect to local dynamic forces.
- 4) Transfer of management will eventually succumb to external forces in case of no local financial autonomy.
- 5) Feasibility of the management transfer can depend on the presence of a specific donor or government funded/run project.
- 6) Lack of alternatives to the slash-and burn agriculture (hatsaké) render local management contracts financially non feasible.
- 7) Space of intervention does not coincide with territorial boundaries of communities. The local value system defines the spatial unity of the management system.
- 8) Two opposing interpretation of conservation values are present.
- 9) Destruction of the natural forest is a mean to acquire relative property rights.
- 10) Success in transfer of management depends on the inclusion of all local stakeholders in the negotiation process and is shaped by the local conditions: the educational level and the possibility of valorizing the forest resources.
- 11) The tenure question is just one out of several causes of deforestation.

Various approaches to explain the social forces in action are deployed in this research project:

- 1) A quantitative approach based on data from a household survey. Information and data from the survey were supposed to answer the questions on changes over time in income and in attitudes towards GELOSE.
- 2) A semi-quantitative and semi-qualitative approach on the land use and changes in property or user rights as a result of the transfer of management of forest resources.
- 3) A qualitative analysis of the forest sector: identification of the major stakeholders, the value chain and the redistribution of income in villages.
- 4) A quantitative approach calculating forest retreat based on interpretation of GIS images, followed up by a ground-truthing exercise.

This chapter will focus on testing hypotheses 4, 5 and 6. In the conclusion, we will shortly refer to hypothesis 10. We intend to use quantitative statistical methods, both logistic regression and chi-square tests, and to discuss the relevance of such methods in cases, as ours, where data are of both quantitative and qualitative character.

Once we started collecting data and interviews during the pilot phase, we realized that completing GELOSE contracts between the three signing parties (Forest Department-municipality-basic community) was the easy part. End 2002, 250 community contracts were signed (Ramamonjisoa, B and Rabemananjara, Z. (2007)). But, once the preparation

phase is over, lack of monitoring and absence of provision of tangible benefits to the community are the reality, the villages have to face. So, assessing the state of the country's forests, and explore whether collecting of forest products, land use patterns and income sources have changed since the introduction of GELOSE has a different meaning than seemed initially to be the case. Since changes, real or not, can not be link up to the introduction of GELOSE. Signing of local management plan is virtually a paper tiger.

If GELOSE is rather a mere administrative adjustment on paper without being coupled to economic advantages or better monitoring of the remaining forest resources, we would expect villagers to react passively or negatively to the administrative changes. It should be recalled that forest subject to GELOSE management regulations can not be exploited free-for-all anymore (see discussion below). We could still make use of the hypotheses, but the initial research question should be reformulated to better reflect the socio-economic setting of GELOSE:

‘Will villagers react passively or negatively to the introduction of GELOSE, since advantages in terms of economic benefits or better monitoring, are not by any standards obvious, and should then the entire idea of introducing GELOSE be considered a failure?’

Study sites and collection methods

The survey was carried out in an area east of Toliara (provincial capital at the southwest coast of Madagascar). We conducted a household and a village survey in 14 villages, covering in all 220 households. Like the initial study (base-line study from 1998/1999) we selected villages from area 1 (Ankazoabo), where forest is still abundant, villages from area 2 (Vinetta), less forested, and finally from area 3 (Toliara II), where the forest has almost disappeared. Out of the 14 villages only two had not signed a GELOSE contract.

The household questionnaire was designed to elicit income information (quantitative questions) and attitudes towards the introduction of GELOSE (qualitative questions) from the respondents. It covered four general areas:

- 1) Demographic and ethnical identities
- 2) Income from agriculture, livestock and forest products (wood and NonWoodForestProducts)
- 3) Land use, relationship to forest authorities and subjective values (positive or negative) assigned to the presence of forest
- 4) Attitudes towards the introduction of GELOSE

In addition, we conducted a village survey more geared to gain knowledge about whether the introduction of GELOSE led to emergence of new economic activities, changes in the traditional management system (in Malagasy ‘dina’), and how people conceived the new restrictions to forest use. In this context, we will treat the village survey more like an addition to the household questionnaire, since households involved in the latter exercise

(household questionnaire) were often also requested to reply to the village survey questions. A total of 51 village surveys were completed.

Approximately 10% of all households in each village were surveyed. A stratified random sampling approach was envisaged with diversity in ethnic group identity as the major selection criterion. Attitudes towards the introduction of local management could be shaped by ethnic background.

Hypotheses testing

We start by testing hypotheses 4 and 5:

- 4) Transfer of management will eventually succumb to external forces in case of no local financial autonomy.
- 5) Feasibility of the management transfer can depend on the presence of a specific donor or government funded/run project

Entering a GELOSE contract did not provide the villagers with any tangible economic benefits. Furthermore, management rules became stricter since fines could be issued from the moment the contract is signed, if the regulations of utilization of the forest resources were circumvented. In all, the management transfer might more be regarded a liability to the community than an economic and social benefit in managing the villages' natural resources. Then, the questions automatically becomes why would the community agree to sign such a contract.

We return to this question later, for now we will attempt to render the hypotheses more operational:

Feasibility can be measured by the question: what are the advantages of GELOSE or what are the alternatives to GELOSE? (Advantages: Collection of wood has improved or better prices, relations to forest authorities have been enhanced or healthier relations between residents and migrants, Alternatives: Cultivate in another forest, try to cancel the GELOSE contract or do nothing)

Presence of a project is equal to responding to the question: Does anyone from outside visit our village to discuss the situation of GELOSE (monitoring exists or not)?

Transfer of management is more difficult to link to one specific question. We proxy the definition of transfer by two options:

- a) What are the problems in introducing GELOSE in the village (answers: Protection works, no comments or no GELOSE forest, and conflicts persist)?
- b) What should be added to the GELOSE contract in order to make your household more satisfied (answers: More control and monitoring, GELOSE works well, Access to non GELOSE managed forest would be

required in order to accept GELOSE restrictions on the adjoin forest area)?

At present, villages do not dispose of any financial autonomy. As an alternative we could redefine the concept to instead cover *financial capacity* (income from agriculture, forest products or non-forest products). Yet, if income is derived from agriculture (maize cropping) we will expect this figure to be negatively correlated with protection of the forest. Hypothesis 4 (transfer and financial autonomy) can not be tested since financial capacity and financial autonomy are not synonymous concepts.

Turning to hypothesis 5 (feasibility and project) we can demonstrate significance between monitoring and people expressing discontent with GELOSE ($p = 0.025$). However, out of a total of 220 households, only 56 responded to both questions. Most of them (44 households) responded that despite discontent with GELOSE, they intended to do nothing. Using the opposite answer (*advantages of GELOSE*) the relationship to monitoring was non significant (66 observations, and $p = 0.417$), see Table 1. Also notice that monitoring, if not complete none existing, is a rare case: 8 out of the 66 outcomes (the quasi absence of monitoring). We conclude that even hypothesis 5 can not be confirmed.

Table 1: Advantages of GELOSE and monitoring, data from household survey, south-west Madagascar, June 2006

<i>Avantages of GELOSE</i>	<i>Monitoring</i>		
	<i>Yes</i>	<i>No</i>	<i>Total</i>
<i>Collection of wood and better prices</i>	2	9	11
<i>Relationship to DEF has improved</i>	4	42	46
<i>Better relationship between residents and migrants and others</i>	2	7	9
<i>Total</i>	8	58	66

As for hypothesis 6 (lack of alternatives and financial non-feasibility) we can already, without testing, conclude that the management contracts are financially non feasible, since restrictions are imposed on the utilization of forest resources (felling is not permitted) and better prices on fire wood (or coffin wood) are not guaranteed. In hypothesis 4 we said that transfer of management will not be successful unless financial autonomy follows from the management contracts. If management contracts are financially non-feasible and they fall short out of granting financial autonomy to users, we could be tempted to write off GELOSE as being a failure. The section which follows will prove this suggestion as non correct.

Different opinions of GELOSE

From the village survey, we detect that in all questions, apart from one (no to the question of changes in the traditional management system), villagers disclose very diverse opinions to the GELOSE transfer of management. We asked whether villages considered the transfer easy or difficult, whether they experienced any change in user right or any change in economic activities and finally how the population was trained in comprehending the borders of the GELOSE forest.

In general, villagers, from the household survey, are either satisfied (42 households), request tougher sanctions against violators (69 households asking for more sanctions and monitoring) or simply respond that they do not intent to change the GELOSE regulations (50 households- here the question is on alternatives to GELOSE). Precaution should be observed in this case, since cross-checking answers revealed that 36 persons have responded to both questions: *suggestions to improvements and alternatives to GELOSE*. Replies to the two questions are found in Chart 1 and 2.

Chart 1: Suggested improvements to GELOSE

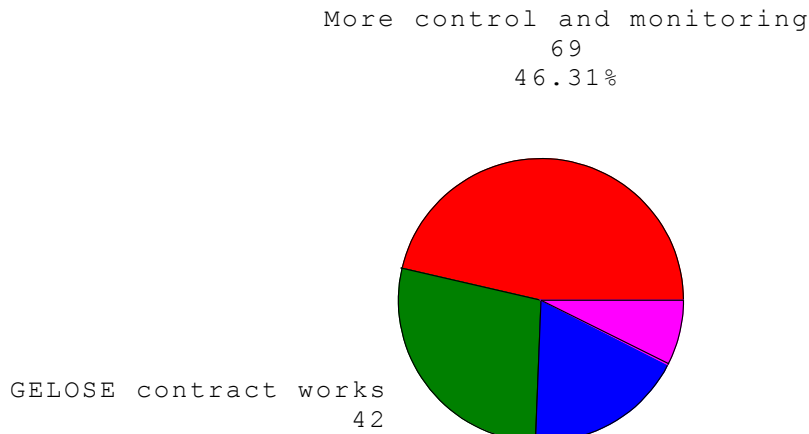
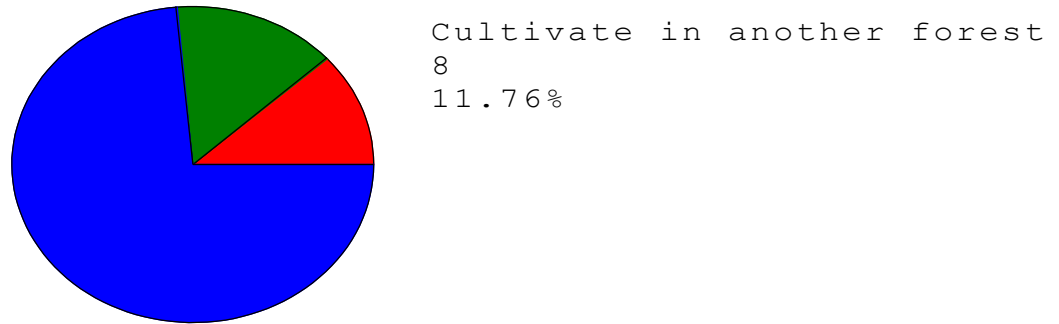


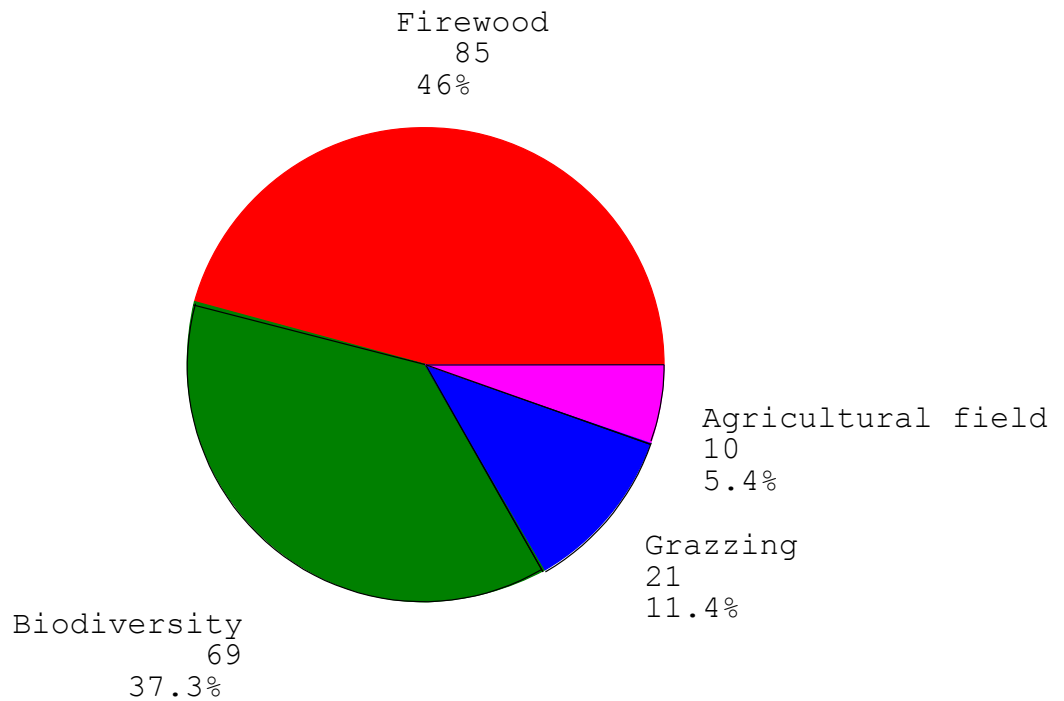
Chart 2: Alternatives to GELOSE

Prefer to cancel contract



Contemplating the values villagers assign to the forest (Chart 3), views vary considerably. Collecting firewood (end product is charcoal) and occasionally construction wood and wood for coffins making is a user right in accordance with the GELOSE regulations. All the other categories of forest values also fall nicely within the framework of GELOSE, the transformation of the forest into agricultural land being the only exception (5% of all answers given). So, despite different attitudes, villagers seem to share the conviction that the forest represents a value in itself to them, not only in terms of additional soil to plant agricultural crops on.

Chart 3: Forest values



We would have expected a different attitude among villagers depending on their relation to the area: resident or migrant. Residents gain relatively more from wood collection than migrants. The difference in mean values is large (means: 320.000 Ar vs. 115.000 Ar) and is clearly significant ($p = 0.008$) using t-tests for two samples of log-transformed values. But when it comes to other products (apart from rice) residents and migrants gain almost the same (means: 300.000 Ar vs. 280.000 Ar, $p = 0.235$). From this we should suspect that residents are supposed to be more concerned about availability of forest resources.

When it comes to the *alternatives* to GELOSE, both migrants and residents alike answer that they do not act against implementation of GELOSE. If the possibility "Do nothing" is excluded from the possible alternatives (Table 2), the remaining table consists of very low counts in the remaining two by two table. If a Fisher's exact test is applied, the probability of independence is hardly accepted, $p = 0.077$, when testing against a one-sided alternative. This means that migrants tend to consider "*Pressure on village chief to cancel contract*" as an alternative to GELOSE more frequently than residents. But the number of observations is very low.

Table 2: Alternatives to GELOSE and ethnicity, data from household survey, south-west Madagascar, June 2006

<i>Alternatives to GELOSE</i>	<i>Migrant or resident</i>		
	<i>Migrant</i>	<i>Resident</i>	<i>Total</i>
<i>Cultivate in another forest</i>	2	6	8
<i>Pressure on village chief to cancel contract</i>	7	3	10
<i>Do nothing</i>	31	19	50
<i>Total</i>	40	28	68
<i>p = 0.105</i>			

Testing the hypothesis of independency between *advantages and ethnicity* by another Fisher's exact testing procedure against a one sided alternative give the significance value $p = 0.058$ which could be seen as an indication of significance. A larger part of migrants than residents judge "*Better relationship between residents and migrants and others*" as the main advantage of GELOSE (Table 3). Other answers cover 'collection of wood and better prices and the category 'relationship to DEF (local forest authorities). In the case of not collapsing these two last categories, the p increases (0.165) which is non significant result.

Table 3: Advantages of GELOSE and ethnicity, data from household survey, south-west Madagascar, June 2006

<i>Frequency</i>	<i>Avantages of GELOSE</i>	<i>Migrant or resident</i>		
		<i>Migrant</i>	<i>Resident</i>	<i>Total</i>
	<i>Other answers</i>	29	40	69
	<i>Better relationship between residents and migrants and others</i>	8	3	11
<i>Total</i>		37	43	80
<i>p = 0.058</i>				

Table 4: Suggested improvements to GELOSE contracts and ethnicity, data from household survey, south-west Madagascar, June 2006

<i>Suggested improvements</i>	<i>Migrant or resident</i>		
	<i>Migrant</i>	<i>Resident</i>	<i>Total</i>
<i>More control and monitoring</i>	39	29	68
<i>GELOSE contract works</i>	30	12	42
<i>No comments</i>	12	15	27
<i>Non GELOSE forest required</i>	8	2	10
<i>Total</i>	89	58	147

p = 0.076

In Table 4 the important answers are ‘*More control and monitoring*’ and ‘*GELOSE contract works*’. When only these answers are considered we arrive at the two by two table for which the hypothesis of independence is accepted, $p = 0.138$. Lastly, we found no relationship between perceived forest possession (main categories are the state and the community) and ethnicity (Table 5).

Table 5: Perception of forest possession and ethnicity, data from household survey, south-west Madagascar, June 2006

<i>Perception of forest possession</i>	<i>Migrant or resident</i>		
	<i>Migrant</i>	<i>Resident</i>	<i>Total</i>
<i>State</i>	48	28	76
<i>Community</i>	54	33	87
<i>Total</i>	102	61	163

p = 0.886

One explorative hypothesis, to derive from this analysis, relates to the predominance of indirect effects. Be that direct economic or institutional advantages of GELOSE are absent in south-west Madagascar, but villagers might gain in bettering relationship among themselves and between the village and the forest authorities in implementing the transfer of management. What at first glance appears as a contradiction, namely the fact that villagers continue to support an arrangement that they do not gain from, is possible

perfectly logic. Compared to the first of the main three criteria for community forestry, ecological sustainability (reducing the rate of deforestation), this is not necessarily achieved, even if villagers agree to the framework of GELOSE. The explanation being that monitoring of forest utilization and persecution of violators are both outstanding issues, not yet covered in the management contract. This in turn could explain why the majority of households are calling for more monitoring and severe actions.

In the following section we will review the general literature on management regimes of natural resources before we test the hypothesis of indirect effects and we attempt to characterize the villagers' attitude towards GELOSE.

Explaining the perception of transferring management

The ultimate aim of any community forest framework is to achieve sustainability, economic efficiency and social equity (included in the original research question). GELOSE does not offer an attractive package to the forest users (villagers). Instead the villagers have to face restrictions in the use of forest resources. Only collection of firewood is sanctioned (upon acquisition of a permit from the forest authorities) and in some cases collection of special wood species for making of coffins.

Many studies of common pool resource management have identified the factors important to success or failure. Agrawal (2002) et al. attempted to bring forward the discussion by dividing factors into four groups: resource characteristics, group characteristics (boundaries, norms and heterogeneity), institutional arrangements (rules simple, graduated sanctions) and finally external factors (government supporting local authority and nested or clear legal framework). In regards to external factors low cost exclusion technology should be available and supportive external sanctioning institutions and appropriate levels of external aid should be in place to facilitate successful governance of the commons. Natural resources need to be characterised by low levels of mobility, predictability and in relation to external factors low level of articulation with external markets.

In our case, the transformed natural resource in the form of maize or firewood is easily transported. Both external aid and sanctioning institutions are absent, and a legal framework, including graduated sanctions, is still not in place in southwest Madagascar. Though rules are simple (authorization to collect firewood and wood for coffin making), we would conclude that the 'standard' conditions are not met. Let us turn to the pure empirical work and case-studies to gain more insight in what triggers success in community forestry.

According to the conclusions in the first meta-study of community forest cases, Pagdee et al. (2006), the factors behind success are not much different from those listed by Agrawal. Success or failure was primarily the result of the researcher's own perception of the outcome of the specific community forestry example (in all 69 case studies). So the meta study does not offer any details as to the statistical significance of the variable success/failure in the case studies. Congruence between biophysical and socioeconomic

boundaries, clear rules and regulations, tenure security, monitoring and sanctions had the strongest association with success in 69 case studies world wide. More surprisingly, value of the resource and forest dependency showed no association with success. The authors' explanation was that neither value nor forest dependency increase the community's awareness of collective actions. Using cross-tabulations, the authors demonstrate statistical significance of local authority (grouping the 69 case studies) only if coupled with tenure security, not as a single standing measure. Lastly, the authors make a plea for the inclusion of forest and community features. No attempt to study these variables was tried out due to lack of data in most of the cases in the meta-study.

In a second general study of community forestry (Gibson et al., 2005), 178 forest user groups in 12 countries were requested to answer whether they thought the forest was abundant, sparse or very sparse. In addition, they should respond to whether monitoring took place and a sanction system was applied in their specific case, and whether a formal organization existed. Finally, they were supposed to indicate dependency of forest products. They concluded that rule enforcement (monitoring and sanctions) was by far the most important category.

A few specific studies have focused on the less common forest and community features. In a study of the Indian Himalaya, Agrawal and Chhatre (2006), use biophysical variables (elevation, rain and a conifer index (either > or <80% of the vegetation consists of coniferous species), economic, demographic and institutional variables. Changes in institutional variables (sanctions) are more important than demographic variables, though the most important group of variables is the group of biophysical factors. Using forest condition (asking user about their opinion) as the dependent variable raises, however, the methodological question of including a conifer index in defining one of the independent variables. A conifer index is one way among others of measuring the forest condition. So the index easily becomes both an independent and indirectly the dependent variable.

Looking at socioeconomic differences between forest user groups in Nepal, Varughese and Ostrom (2001) found no evidence to support the argument of heterogeneities in village ethnicity having a determinant impact on intensity of collective action. In this case intensity of collective action was the focus, rather than success/failure in achieving one of the objectives of community forestry (the ecological, economic or equity criteria).

In our case, in south-west Madagascar, the dependent variable is also not 'success' or 'failure' in community forestry. It is the villagers' proper perception of the local management contracts we will attempt to comprehend.

Conclusion

In course of carrying out the research project, we changed the focus. From one searching originally for a proper assessment of the transfer of management of forest resources in southwest Madagascar, to one of attempting to figure out why villagers by and large decide to support the transfer of management, despite the lack of direct positive effects in terms of economic benefits or institutional advantages in the management contract. So,

villagers did not react negatively, but in some cases passively to the introduction of GELOSE.

We made the observation that neither financial autonomy nor emergence of alternatives to hatsaké followed from the implementation process of GELOSE (hypothesis 4 is not being tested, and hypothesis 6 is rejected). We also rejected hypothesis 5 about a possible link between feasibility of the management transfer and a government/donor run project. No economic benefits can be identified in the GELOSE contracts and monitoring of the forest areas is almost absent, still villagers did not reject the GELOSE approach. This is what we draw as our first conclusion.

Dealing with the answers to the question about villagers' perception of the future of GELOSE, the inherent problems and alternatives to GELOSE revealed a general interest in the management contracts. In fact, a little less of half the respondents (46%) asked for more control, monitoring and sanctions against violators of the regulations in the GELOSE forest areas. Another 30% of the households believed that the GELOSE contracts were working well.

Looking at the answers to the question about the advantages of GELOSE enabled us to come closer to explain why villagers in general opted for this positive attitude. Most people saw better relations to the forest authorities being the main advantage of the GELOSE contracts. Indirect benefits more than direct benefits could explain the positive rallying behind the GELOSE contracts. This is our second conclusion.

Pulling the last two observations together, we face another challenge. Did the positive attitude towards GELOSE has its origin in a genuine interest in protecting the forest (calling for more control and sanctions) or was it the result of reaping the benefits of better relations to the forest authorities, meanwhile being able to continue exploitation of the forest just as before GELOSE (due to lack of monitoring measures in the GELOSE contracts)? Further research (second data collection due in May-June 2007) will try to dig into this field of unsolved issues.

Is GELOSE a failure? In the sense that deforestation continues, the answer is affirmative. However, Razafy (2007) demonstrates that the deforestation rate in the GELOSE managed forests in southwest Madagascar is marginal. In the sense that economic alternatives did not follow in the leeway of introducing GELOSE, the answer is affirmative. In the sense that GELOSE contracts did not enhanced the income of the poor, the answer is once again assenting. Yet indirect, secondary effects can spur from the GELOSE contracts (better relations to the forest authorities), and this contradicts the idea of a local management malfunction in Madagascar (at least in the south-west). A final conclusion is not straight forward.

Departing from a general view that 'most devolved natural resources management reflects more rhetoric than substance' (quoting Shackleton et al., 2002), Blaikie (2006), critical to local transfer contracts, suggests reorientation of assessment criteria. More focus should be accorded to the political conditions under which management transfer

contracts are negotiated between donors and recipient countries. Focus should be extended also to look at the interface between community forestry programs and local communities. These are the conclusions of Blaikie. We claim that many studies of community forestry programmes do not deal with the possible articulation of indirect effects in terms of better (or worse) relationships between stakeholders.

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