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Global Practice

Analysis of Community Forest Management (CFM) in Madagascar

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LIST OF ACRONYMS

ATT	Average Treatment effect on the Treated
CAZ	<i>Corridor Ankeniheny-Zahamena</i>
CBNR	Community-Based Natural Resources
CBNRM	Community-Based Natural Resources Management
CFM	Community Forest Management
CMFR	Community Management of Forest Resources
CNAT	<i>Comité national d'aménagement du territoire</i> (Urban Planning National Committee)
COAP	<i>Code sur les aires protégées</i> (Protected Areas Code)
CTD	<i>Collectivités territoriales décentralisées</i> (Decentralized Territorial Units)
ENSOMD 2012	<i>Enquête nationale sur le suivi des objectifs du millénaire pour le développement à Madagascar 2012</i> (2012 National Survey on the Monitoring of Madagascar Millennium Development Goals)
EPM 2010	<i>Enquête périodique auprès des ménages 2010</i> (2010 Households Periodic Survey)
FDL	<i>Fonds de développement local</i> (Local Development Fund)
FFN	<i>Fonds forestier national</i> (National forest Fund)
GCF	<i>Gestion contractualisée des forêts</i> (Contract-Based Management of Forests)
GELOSE	<i>Gestion locale sécurisée</i> (Secured Local Management)
IGA	Income-Generating Activities
INSTAT	<i>Institut national de la statistique de Madagascar</i> (Madagascar National Institute for Statistics)
JORM	<i>Journal officiel de la République de Madagascar</i> (Official Journal of the Republic of Madagascar)
LP2D	<i>Lettre de politique de décentralisation et de déconcentration</i>

	(Letter of Decentralization and Devolution Policy)
MECIE	<i>Mise en compatibilité des investissements avec l'environnement</i> (Making investments compatible with the environment)
MEPATE	<i>Ministère d'Etat en charge des projets présidentiels, de l'aménagement du territoire et de l'équipement</i> (Ministry in charge of Presidential projects, Urban planning and Equipment)
MNP	Madagascar National Parks
NDP	National Development Plan
NFD	National Forest Domain
NGO	Non-Governmental Organization
PES	Ecosystem services
PFL	Timber Products (<i>Produits Forestiers Ligneux</i>)
PGE	Politique Générale de l'Etat (General State Policy)
PN2D	<i>Projet national de décentralisation et déconcentration</i> (National Decentralization and Devolution Program)
PNAT	<i>Politique nationale d'aménagement du territoire</i> (National Policy on Urban Planning)
PNDR	<i>Programme national de développement rural</i> (National Rural Development Program)
PNFL	Non-timber Forest Products (Produits Forestiers Non Ligneux)
REDD	Reducing Emissions from Deforestation and Forest Degradation
RNR	Renewable Natural Resources
SFR	<i>Sécurisation foncière relative</i> (Land Tenure Securing)
VOI	<i>Vondron'Olona Ifotony</i> ('grassroot community')

COMMUNITY-BASED FOREST MANAGEMENT IN MADAGASCAR

1. Madagascar is blessed with unparalleled biodiversity and natural resources. It is estimated that five percent of known species worldwide are found in Madagascar, and approximately 90 percent of flora and 70 percent of vertebrae are endemic. The country is also blessed with a wide variety of landscapes and vegetation types, ranging from dense and humid forest in the north and eastern escarpment, to dry forest in the west and semi-arid spiny forest in the south. The spectacular landscapes as well as terrestrial and marine ecosystems constitute the country's main trump card for tourism. The protected area network and forests also provide other benefits in the form of hydrological services, regulating the flow of water and helping to reduce floods and water shortages, essential services for downstream urban water users and hydroelectricity generation. Forests help to reduce soil erosion and therefore sedimentation, which can adversely affect agricultural activities, and in particular irrigated perimeters downstream.

2. In contrast with its unique wealth, poverty in Madagascar has risen and is now among the highest in the world. Recent estimates show that in 2012, about 78.2 percent of Madagascar's 22 million people was living on less than USD 1.25 a day (PPP) and approximately 91.2 percent of the population was living on less than USD 2.00 a day. When using the national poverty line, 70.7 percent of Malagasy lives in absolute poverty and 58.2 percent lives in extreme poverty. The youth tend to be poorer: 51 percent of the poor is less than 15 years of age, while the population over the age of 65 represents only 2 percent of the poor. About a third of the population in Madagascar is deprived at many levels. This part of the population is the so-called "have nots," disadvantaged in terms of consumption, literacy and education, basic household assets and electricity.

3. The balance between natural wealth and livelihoods is extremely fragile. Local, often isolated, rural populations depend on the country's natural resources to ensure basic livelihoods. Poverty in rural areas, where approximately 80 percent of the population lives, is higher (77.9 percent of the rural population) than in urban areas (35.5 percent of the urban population) and generally the further away from urban centers the more precarious living conditions are. Livelihoods heavily depend on subsistence agriculture, fragile pasture lands, timber and fuel wood, and small scale fisheries. Population growth, estimated at 2.8 percent p.a. has increased demand for agricultural land both for subsistence production and for cash crops and has consequently increased the pressure on forests. Poor soil management in areas outside of forests reinforces expansive land clearing and incursions into forest areas where the soil is more fertile.

4. Community-based forest management, or CFM, is a key tool to transform this fragile poverty-environment balance into a virtuous cycle of development. CFM was conceived as a way to increase conservation effectiveness by devolving power and rights to local communities. A key tool for this to work is to improve local livelihoods through direct resources management. Madagascar is one of the first countries in the southern hemisphere to have put in place a legal framework for community-based natural resources management, with the GELOSE (*gestion locale sécurisée*) law (law 96-025) in 1996. The GELOSE promotes the transfer of management of a range of different natural resources to local communities. This was followed in 2001 by a forest-specific decree known as *gestion contractualisée des forêts* or GCF (decree 2001-122).

5. The key ingredients of CFM contracts include an agreement between individuals from the local community and the administration, clear terms of use of the resource, land tenure rights and the support of a mediator and of non-governmental organizations (NGOs). The process starts with the creation of a local natural resources management group (in Malagasy *Vondron'Olona Ifotony* (VOI), or Grassroots Community). The VOI operates according to a set of rules (*dina*). Once created, the VOI can request the transfer of management of a given resource from its legal owner, be it the State or the local authority. The contract is signed by three parties: (i) the VOI; (ii) the owner of the resources, be it the State or the Municipality (in the case of forests, typically the forest administration); and (iii) the Municipality (Commune), which is the most decentralized institution with elected leaders. The typical forest Community Based Natural Resource Management (CBNRM) contract is often established with support from NGOs and requires the expertise of an environmental mediator, who would ensure that the needs and objectives of all stakeholders involved in the negotiations are given equal weight. Land tenure security is a key principle of the law.

IMPACT EVALUATION

6. This report uses impact evaluation as a tool to measure the effectiveness of CFM implementation on two key variables: deforestation and well-being. Impact evaluation assesses the changes on a variable of interest that can be attributed to a particular intervention, such as a project, program or policy. To measure the impact of CFM policy on conservation we compared the extent of deforestation between CFM areas and similar non-CFM areas. To measure the impacts on people's well-being we used the annual household per capita consumption expenditure in CFM areas and compared it to the level of annual household per capita consumption expenditure in similar non-CFM areas. To deal with the possible non-random application of CFM policy (e.g., the policy is more likely to be applied in areas where the pressure on forests is high, or where conservation efforts had been ongoing before the policy was put in place), statistical matching was used. Statistical matching consists in selecting 'untreated' (i.e., non-CFM) units that have characteristics most similar to 'treated' units at pre-intervention baseline.

7. The analysis suggests that decentralization of forest management to local communities in Madagascar may not have, on average, achieved its forest conservation goal. In terms of deforestation, we cannot detect an effect, on average, of CFM compared to non-CFM sites, even after restricting the sample to those sites for which quality of implementation is higher, at least in recorded documents (i.e., where the CFM has passed the forest administration's evaluation three years after establishment).

8. While CFM might have failed, on average, to reduce deforestation relative to non-CFM, non-commercial CFM appears to have had more success, albeit a small one. Putting all types of CFM in one basket would lead to the conclusion that CFM is not an effective approach to reduce deforestation, obscuring the positive impact non-commercial CFM appears to have had. The reasons why non-commercial CFM may have had relatively more success include the fact that pure conservation sites may have had access to more finance (e.g., through compensation payments to local communities) than sites in which commercial use of forests was allowed. Some non-commercial CFM in the sites analyzed in *Didy*, *Tsitongambarika* and *Menabe* practiced direct payments to conservation schemes to offset restrictions introduced by interventions.

9. The transfer of forest management rights to local communities has not improved household economic living standards in Madagascar at the municipality level. There is no statistically significant difference between households in CFM sites and comparable households in non-CFM sites. However, CFM has enhanced the economic living standards at a more local scale, for households living along forest edges.

THE LEGAL AND INSTITUTIONAL FACTORS AT PLAY

10. There are four main underlying drivers of the relative ineffectiveness of the CFM policy observed in this study. The first one is that the GELOSE law, which is the pillar of CFM in Madagascar, has never become fully functional as it was never complemented by the required implementation decrees. This regulatory gap is also compounded by the internal contradictions present in other legal texts on forest areas. The second driver is found in the lack of consistency between different sectoral laws and policies and the CFM policy. This opens the way for conflicts and ineffectiveness. Thirdly, different actors involved in CFM implementation may have diverging objectives that are not necessarily compatible, but also not necessarily compatible with CFM objectives in general. Lastly, law enforcement and the rule of law present substantial weaknesses both at the local and at the national levels. These reasons suggest that the problems may lie more with the implementation aspects of the CFM policy, rather than the policy itself.

Related to the GELOSE law implementation:

11. A first issue is that while GELOSE requires the application of multiple decrees and regulations, these regulatory efforts remain unachieved to date. GELOSE covers forests, wild

terrestrial and aquatic fauna and flora, water and the transition land areas (art. 2). Depending on the type of resource, it is the responsibility of the relevant Ministries and local authorities to establish, through legal and regulatory provisions, the law's implementation modalities (art. 56). However, only the forest administration has so far produced an implementation text through Decree 2001-122 known as GCF. The decree sets out the conditions for the implementation of community-based management of forests of which the State considers itself the owner. In practice, all 1,248 CFM contracts signed to date are contracts for which the State is the resource owner.

12. The intended coherence between 'legal' and 'legitimate' resource use rights also remains unachieved. In issuing the GELOSE, the legislator has made an unprecedented effort to recognize both the customary rights of populations in their local environment (*terroir*) (art. 1), and the ultimate property rights of the State or decentralized authority (art. 2). For this association between 'legitimate' and 'legal' rights to work, the law requires: (i) the intervention of an environmental mediator, whose role is to ensure that all stakeholders involved in the negotiations are given equal weight, given the divergent interests at play (decree 2000-028); (ii) the possibility of providing relative land tenure security¹, after joint delineation of the land subject to management delegation; and (iii) the responsibility of the municipality in the definition and implementation of its territorial development policy. These three principles, however, have not yet been fully implemented. In some cases, other environment-related texts (e.g. the 2001-122 Decree about GCF) have opened the way for ad hoc arrangements pertaining to community participation in natural resources management, further weakening the application of the law's basic principles.

Related to the lack of consistency between CFM and the different sectoral texts:

13. The ineffectiveness of the CFM policy in promoting conservation and boosting the livelihoods of local communities can also be linked to the weak integration of CFM in non-environmental sector policies, in spite of substantial progress over time. The analysis conducted for this report reviewed key pieces of sector legislation including those on land tenure, agriculture, energy and mining, and decentralization, among others. The review concluded that important progress has been made over the years. Yet, the lack of synergy with land tenure policy is particularly problematic. Synergies do exist in the texts, notably with the agriculture and decentralization policies, but weak implementation, owing generally to lack of resources, means that more could be done in practice.

¹ The 98-610 decree about relative land tenure securing (SFR) gives the opportunity to communities (that got transferred the management of natural resources) to mark off their land and have decentralized services register the limits.

Related to the diverging objectives of the main stakeholders involved in CFM implementation:

14. The stakeholder analysis reveals a potentially inefficient power/relevance mix. In particular, it is important to note that the three entities that are parties to a typical CFM contract (VOI, forest administration and Municipality) are not in the same stakeholder group along the proposed influence/relevance matrix. The VOIs are low-influence / high-relevance stakeholders, whereas the forest administration and the Municipalities are high-influence / high-relevance stakeholders. The interests of the former risk being under-represented in policy decisions and implementation. In addition, it is possible that the objectives of the more conservation-oriented forest administration are not completely aligned with those of the Municipality, which represents not just communities living near the forest but all communities in the municipal territory (including those in agricultural areas and urban areas). This delicate balance may be also affected by ‘external’ (with respect to the contract) agents such as NGOs, donors and the law enforcement authorities, which all have important influence on the implementation of CFM.

Related to the weakness of law enforcement and rule of law:

15. Enforcing community-based forest contracts has proved challenging at two distinct levels. At the local level, community-led enforcement may be ineffective when dealing with agents that are external to the VOI or to the community altogether. At the sub-national and national levels, the problems of weak rule of law, corruption in the administration and the judiciary, and poorly equipped law enforcement agencies are more common.

16. However, it is worth mentioning that the primary objective of the GELOSE law, which is to incite and promote local people’s participation in the conservation of renewable natural resources was reached. Without any nationwide information campaign, the number of signed contracts is remarkably high; which makes Madagascar one of the most engaged developing countries in CFM. With CFM contracts, local populations’ capacities were reinforced; they tend to gather in federations in order to better tackle the challenges of sustainable development and to position themselves as direct interlocutors for donors.

A BLUEPRINT FOR ACTION

17. Poverty and environmental degradation can interact in complex ways and in ways that are often detrimental to both human livelihoods and the environment. For communities relying on natural resources the journey from poverty to prosperity is likely to be a gradual one, especially among households with low levels of education and few employment opportunities. Forests may provide a stepping stone that helps to move the chronically poor to the moderate poverty levels, and lifts the sometimes-poor out of poverty. CFM is one potential tool for this to happen. The evidence from a number of countries shows that CFM can indeed be an important tool for conservation and development. Case studies from Australia and Kenya show that success is possible, particularly when

the projects are initiated by the communities themselves. Brazil demonstrates how forests under the management of indigenous peoples are better protected than other forests.

18. Encouraging examples of community conservation in Madagascar point to the fact that success is indeed possible. The *Anja Miray* Association, established in 1999 in response to the degradation and clearing of local forests, the sedimentation of water resources, and the loss of wildlife such as ring-tailed lemurs, chameleons and tropical birds, is successfully operating a 30-hectare community forest reserve in the *Haute Matsiatra* region of Madagascar. The community has established an ecotourism initiative which funds community works projects – schools, health clinics and environmental education – and ongoing conservation activities. Ecotourism has also provided a revenue stream for alternative livelihood projects such as fish farming and tree nurseries.

19. Public policy should be geared to allow the spread of successful examples. The analysis in this report allows to identify some key constraints in the application of CFM and CBNRM in Madagascar and to sketch a number of recommendations in the short, medium and long terms.

- a. In the short term, the Government and its partners should seek to maximize consistency between the GELOSE, the forest law and the land tenure law. It should also aim at filling the gaps in the CFM legal and regulatory framework and correct the inconsistencies between the different forest and environment-related texts. However, this objective must take into account the significant progress in environmental international and national laws, as well as the specificities of the Malagasy judicial order.
- b. In the medium term, the target should be to strengthen the capacity of the State, both central Government and regional services, to plan and implement CFM policy. The State could address the financial constraints that VOIs and municipalities face through performance-based payment schemes, taking for example advantage of REDD+ projects and programs, and payment for ecosystem services schemes more generally. In this context, capacity building coupled with the networking of the VOI is an opportunity not to miss.
- c. In the longer term, the aim should be to strengthen the capacity for law enforcement and to strengthen the traceability of forest products. Suspending or prohibiting the commercial use of forest products would not solve the issue. On the contrary, the suspension and prohibition measures tend to demotivate the VOI from investing in sustainable management of the resources. Adequate investment in forest products traceability and control mechanisms are key to allowing the profitable and sustainable use of forest resources. The role of the decentralized territorial units (CTD), particularly the municipalities is crucial; indeed, it is them that are in charge of the implementation of the 2 essential components for regulating access to renewable natural resources: management: land tenure and spatial planning (*aménagement du territoire*).

I. COMMUNITY FOREST MANAGEMENT (CFM) IN MADAGASCAR

A. BACKGROUND

1. The major role tropical forests play in biodiversity and climate change has led the world to search for effective ways to slow down deforestation. Many approaches have come in and out of fashion. Strictly protected areas, which prohibit most human activities, were popular in the early days of conservation and remain so today. Protected areas have had some success at reducing deforestation (Geldmann et al. 2013). However, their negative impacts on the livelihoods of local communities, such as access to forest resources (Brandon and Wells 1992; Adams et al. 2004; Wilkie et al. 2006) undermined their effectiveness and legitimacy. This led to the development of approaches integrating forest protection and local livelihoods. One of these approaches is community-based management of forests, also known as Community Forest Management (CFM). CFM emerged in the late 1980s (Hutton et al. 2005). By involving locals in forests management, CFM has the potential to benefit both the forests and local livelihoods (Behera 2009).

2. CFM is an example of the broader concept of community-based natural resources management (CBNRM). Numerous definitions and interpretations of CBNRM exist (USAID, 2013). Generally speaking, CBNRM involves defined groups of individuals living in a given territory collaborating on the utilization and the regulation of natural resources. Dressler et al. (2010) defines it as the “devolution of rights to make management decisions and capture benefits, in relation to resources located on community lands”. A key rationale for CBNRM, and CFM in particular, is that communities are in a good position to protect natural resources and to manage benefits generated by the extraction of natural resources as they possess a good knowledge of the ecosystems they are living in. Because their livelihoods rely greatly on these ecosystems, local communities might be motivated to implement sustainable management rules and long term conservation efforts (Pollini et al. 2014).

3. As part of the decentralization policy in many countries, mainly in Africa and Asia, CFM was expected to promote i) a more effective stewardship of the resources by involving the local communities in the management of the resources and ii) a more locally-driven development with them tapping most of the derived benefits. CFM is tightly related to the decentralization policy, it is an institutional response to the limitation of the State’s interventions in forest management, and to promote local, active democracy and the rule of law. CFM objectives include transferring decision responsibilities and the management of wooded lands to the local communities, which can be provided with legal status and financial responsibilities. Transfer of forested land property can eventually occur although not often. The rationale is to provide local communities with all the rights

and duties/responsibilities, making them the main responsible of the management of the forests (implicitly, they are expected to be better stewards of the forests than the Forest administration because they are the primary group directly affected by the results of the decisions they are themselves taking). CFM was is expected to initiate i) a collective awareness of a better local democracy (especially in terms of the decision-making process related to the management of forest resources) and thus, have community members change their behavior with a more sense of ownership; and ii) a local auto-centered development because the communities are expected to reap the entire/big part of the eventual benefits from forest management. Those benefits, in turn, can be re-invested into forest management and/or to local development, especially into social infrastructures. In principle, the Forest administration is there to provide technical and legal support to the local communities and thus building their capacity in those aspects. In return though, the local community has to cover itself all the costs (including patrolling and securing the integrity of the resources, etc.).

4. The precursors of CBNRM and CFM in Madagascar are the centrally-led compensation-based mechanisms to conservation. These included programs against bush-fires and projects aiming at integrating conservation and development, implemented in the beginning of the 1990's. The approach was basically aimed at compensating communities beyond just covering the local opportunity costs of resource preservation. Projects under this approach were designed by stakeholders external to the community and, while relying on local communities' participation, did not substantially change tenure and power relations (Dressler et al., 2010). The Government and conservation agencies soon realized the need to shift the model from a mere 'consultation-based' model (to approve and implement an external agenda) to an 'engagement' model, based on the recognition of key local stakeholders, and thus, the invitation to negotiate their own management objectives. This is how CFM was conceived in Madagascar: as a way to increase conservation effectiveness by devolving power and rights to local communities. A key tool for this to work was to improve local livelihoods through the direct resources management.

5. Madagascar is one of the first countries in the southern hemisphere to have put in place a legal framework for CBNRM and CFM (Andriantsilavo et al., 2006; and Montagne et al., 2007). The country introduced CBNRM in its natural resource policy in 1996 with the GELOSE (*Gestion Locale Sécurisée*) law (law 96-025)² which promotes the transfer of management of a range of different natural resources to local communities. This was followed in 2001 by a forest specific decree known as *Gestion Contractualisée des Forêts*³, or GCF, (decree 2001-122). Based on the 1990 Environmental

² The law, approved on 30 September 1996 and recorded in the official bulletin (*JORM n° 2939 du 14 Octobre 1996, p. 2377*), is officially referred to as "*Loi n° 96-025 relative à la gestion locale des ressources naturelles renouvelables*". The term GELOSE comes from the expression "Gestion Local Sécurisée", that is, Secured [in terms of right of use] local management [of renewable resources].

³ Literally: "management of forests by contract".

Charter, the legislation aimed primarily at involving local populations in the management of renewable natural resources, thus, their involvement in reducing deforestation and protect the significant part of the world's biodiversity that is endemic to Madagascar (Raik 2007; Le Saout et al. 2013). Since the GCF decree, the number of CFM units increased rapidly and continues to grow (Aubert et al. 2013), reaching a total number of 1,248 signed contracts between 1996 and 2014⁴.

6. The CBNRM implementation process starts with the creation of a local natural resources management group. The local management group, in Malagasy *Vondron'Olona Ifotony* (VOI) which literally means 'group of individuals from the base', "consists of any group of voluntary individuals, united by the same interests and complying with convened rules of the group. It may include inhabitants of a hamlet, a village or group of villages" (art. 3 of the GELOSE law)⁵. Participation to the VOI is voluntary and any person residing within the boundaries of the VOI territory may submit an application to the VOI's General Assembly to become a member. By this act, the person agrees to comply with the operating rules, the activities and the objectives of the VOI (art. 5 of the GELOSE law). Such rules often include the payment of a one-time membership fee, the payment of monthly or quarterly fees to cover the running costs of the management committee of the group, and agreeing to participate in activities that the group convenes to conduct, such as attending General Assembly meetings, patrolling the forests on a regular basis and giving up on certain traditional economic practices (e.g. slash-and-burn agriculture, or wildlife hunting). In terms of structure, the VOI has to have: (i) a deliberative body (the General Assembly of all VOI members); (ii) an executive body (the Management Committee, with at least a president, a vice-president, a secretary, a treasurer, and several advisors); (iii) operational and financial management rules (Statute, rules of procedure or *dina*); and (iv) other structures such as the local forest controllers (*polisin'ala*) in charge of patrolling the forests on a regular basis and report any infractions to the Management Committee. See Figure 1.

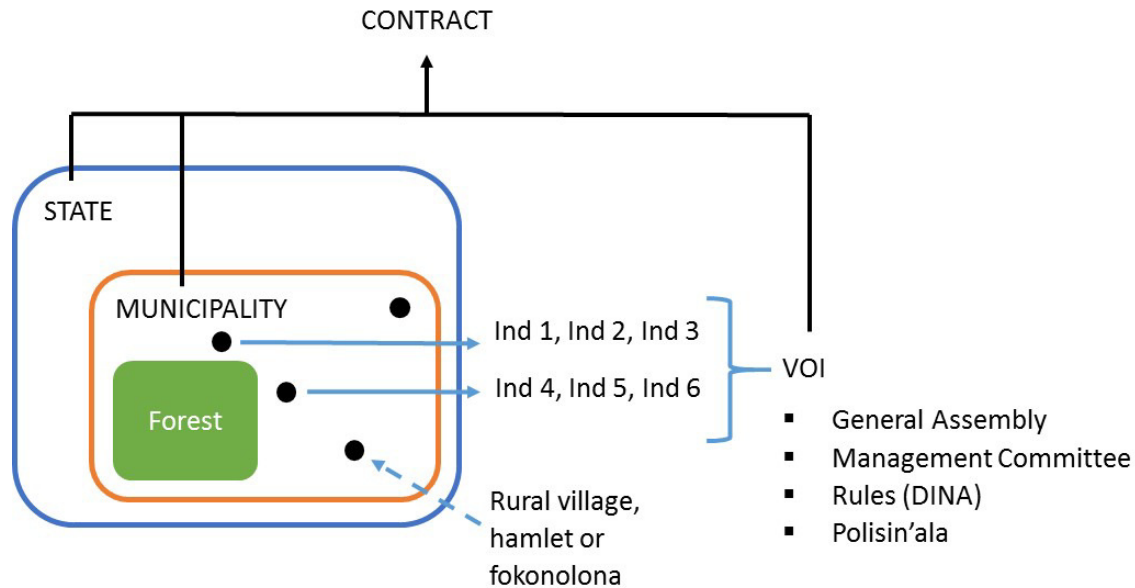
7. Once created, the VOI can request the transfer of management of a given resource from its legal owner, be it the State or the Decentralized Territorial Units (CTD). The contract is signed by three parties: (i) the VOI; (ii) the owner of the resources, be it the State (in the case of forests, typically the forest administration) or the CTD; and (iii) the Municipality (*Commune*), which is the most local decentralized institution with elected leaders (Raik 2007; Froger and Méral 2012; Pollini and Lassoie 2011; Aubert, Tchouso, and Razafiarijaona 2013). The typical forest CBNRM contract: (i) is valid for an initial period of three years, evaluated by the forest administration and if successful, renewed for another ten years; then, evaluated again before becoming a definitive agreement; (ii) involves the management of specific natural resources located within the boundaries of the local communities; (iii) is often established with support from non-governmental organizations (NGOs) or

⁴ *Direction de la valorisation des ressources forestières* (DVRF) census, from Alexio Clovis Lohanivo's Doctorate research. Alexio is a researcher from ED-GRND of ESSA.

⁵ Details about all legal aspects of VOI are to be found in Appendix A.

other external stakeholders because of the importance of the preparation of technical and official documents (e.g. management plans, zoning resource maps and the contract itself); (iv) normally requires the expertise of an environmental mediator, who would ensure that the needs and objectives of all stakeholders involved in the negotiations are given equal weight; and (v) includes land tenure securing. In reality, these last two provisions have not been implemented universally.

Figure 1. Key stakeholders in CFM contracts



8. **A natural resources management group, or VOI, does not need to coincide with the most traditional forms of 'local community'.** This is a key feature of CBNRM practice in Madagascar and one that needs to be kept present when interpreting the results of the CBNRM policy implementation (section 3 also provides a brief stakeholder analysis). In fact the VOI is in practice an association of individuals who decide to collaborate to achieve certain goals. These associations do not (they could, but often do not) necessarily correspond to the group of people that, by ancestry, family link and by sharing similar customs, but they had broad autonomy of management, including at the security and judicial level, and operated following the code of *dina* (social pact). CBNRM policy adopts some of the key traditional governance tools, but applies them to associations of people that may or may not coincide with the *fokonolona*. Originally, in the 1990's, it was intended that the term be used for the transfer of management of natural resources to local communities, that is *fokonolona*, but the proposition was rejected at the time by the Parliament because of the semantic vagueness of the concept (Bertrand et al., 2014). Hence, the concept of VOI came to be with the assumption that it would include a big part of the *fokonolona* and that the newly created association would provide legitimacy to conservation actions within the community. In fact, the term "*Fokonolona*" is polysemous: in the highlands culture, it represents a group of people that, by ancestry, family link and

by sharing similar customs. In 1972, the term was used to describe a legal territorial assembly, which, currently refers to the population of a *Fokontany*. The polysemous nature of the terms “*Fokonolona*” and “*dina*” allow various interpretations of the formalization of the traditional and the legal dimensions in CFM contracts; which can be a strength and/or a weakness for the law.

B. RELEVANCE OF CBNRM FOR MADAGASCAR

9. Madagascar is blessed with unparalleled biodiversity and natural resources. It is estimated that five percent of known species worldwide are found in Madagascar, and approximately 90 percent of flora and 70 percent of vertebrae are endemic. As such, Madagascar’s national parks and forests constitute a global public good, for which national and international partners share responsibility. The country is also blessed with a wide variety of landscapes and vegetation types, ranging from dense and humid forest in the north and eastern escarpment, dry forest in the west and semi-arid spiny forest in the south. The spectacular landscapes as well as terrestrial and marine ecosystems constitute the country’s main trump card for tourism. It has been estimated that 70 percent of tourists traveling to Madagascar visited at least one protected area. The protected area network and forests also provide other benefits in the form of hydrological services, regulating the flow of water and helping to reduce floods and water shortages, essential services for downstream urban water users and hydroelectricity generation. Forests help to reduce soil erosion and therefore sedimentation, which can adversely affect agricultural activities, and in particular irrigated perimeters downstream. It is estimated that protected areas provide water services for at least 430,000 hectares (1,062,553 acres) of irrigated perimeters, and drinking water to 17 major towns.

10. In contrast with its unique wealth, poverty in Madagascar has risen and is now among the highest in the world. Recent estimates show that in 2012, about 78.2 percent of Madagascar’s 22 million people was living on less than USD 1.25 a day (PPP) and approximately 91.2 percent of the population was living on less than USD 2.00 a day. When using the national poverty line, 70.7 percent of Malagasy lives in absolute poverty and 58.2 percent lives in extreme poverty. The youth tend to be poorer: 51 percent of the poor is less than 15 years of age, while the population over the age of 65 represents only 2 percent of the poor⁶. Preliminary estimates suggest that from 2008 to 2013, the proportion of the population living below the poverty line, already high before the crisis, may have increased by 10 percentage points, with the larger effects over 2011-2013, as the crisis continued to deepen. When population growth is factored in, it is estimated that 4 million more Malagasy live below the poverty line than in 2008. About a third of the population in Madagascar is deprived at many levels. This part of the population is the so-called ‘have nothings’, disadvantaged in terms of consumption, literacy and education, basic household assets and electricity.

⁶ These data are part of a *Poverty, Gender and Inequality Assessment* undertaken between mid-2013 and mid-2014.

11. The balance between natural wealth and livelihoods is extremely fragile. Local, often isolated, rural populations depend on the country's natural resources to ensure basic livelihood. Poverty in rural areas, where approximately 80 percent of the population lives, is higher than in urban areas and generally the further away from urban centers the more precarious living conditions are. Livelihoods heavily depend on subsistence agriculture, fragile pasture lands, timber and fuel wood, small scale fisheries. Livelihoods rely mostly on forests and other natural resources. Population growth, estimated at 2.8 percent p.a. has increased demand for agricultural land both for subsistence production and for cash crops and has consequently increased the pressure on forests. Poor soil management in areas outside of forests reinforces expansive land clearing and incursions into forest areas where the soil is more fertile.

12. The government has identified the protection of natural capital and the harnessing of its value as a key pillar in its National Development Plan for 2015-2019. The Plan identifies poor governance as a major constraint to achieving the country's development objectives. It puts strong emphasis on the roles of both natural capital and the necessity for a more inclusive economy to achieve sustainable development. Its goal is to "build a new and strong Madagascar and to transmit to future generations a peaceful, united and prosperous country able to become a world leader in the valorization and the preservation of its immense natural capital based on a strong inclusive growth at the service of sustainable and equitable development of all territories". The recent presidential declaration at the World Parks Congress (WPC) in Sydney, in 2014⁷, reinforces this vision.

C. RELEVANCE OF THE WORK FOR THE WORLD BANK

13. This report will help the bank take stock of the nearly two-decades of implementation of the National Environmental Action Plan and provide nation-wide facts that will inform future investment in renewable natural resources management, biodiversity conservation and poverty reduction and local development in the future. In 1989, the Government of Madagascar, with the support of the Bank devised Africa's first National Environmental Action Plan, a long term commitment to environmental protection for Madagascar. Initially planned for 15 years, it has been extended until the end of 2015. Under the NEAP's three phases, chronologically, the Bank helped the Government create a proper policy, regulatory and institutional framework (phase 1:1991 to 1997); put in place different national institutions (ONE, ANGAP, etc.) to promote good stewardship of the country's natural resources (phase 2: 1997 to 2003) and mainstreaming environment into macroeconomic management and sectorial programs that focus on results at the regional and field

⁷ The commitment consists in making the "7 million hectares of protected areas not to become islands in the middle of deserts and lavaka, but for them to thrive within living land and seascapes where they will be the center piece of an integrated vision, in which economic sectors fully mainstream environmental values, and that is supported by concerted land use planning, equitable resource distribution and transparent governance".

levels, which includes accelerating and scaling-up transfer of forest management rights to provide a utilitarian incentive for improved management (phase 3: since 2003). Aside from supporting the Government for achieving those main goals for each phase of the Program, the Bank always collaborated closely with the Government in adjusting and undertaking adaptive management during the implementation of NEAP: including (but not limited to) scaling back overly ambitious objectives during phase 1, creating a strategic, results-oriented logical framework that involved more stakeholders to reinforce ownership, etc. One of the lessons learned during the NEAP implementation, and related to the current work is the “need for a viable environmental policy framework”: Madagascar has managed to mainstream the environment into many of its sector policies, the legal and policy framework is well established; the environmental impact assessment law, the forestry policy law, the protected area code, the GELOSE law (which is based on the principle of subsidiarity management of natural resources) and the foundation law undoubtedly provide a solid foundation for a sustainable environmental management. Taking stock of what happened during the implementation of NEAP, the current work seeks to inform future investment in biodiversity conservation; especially by providing nationwide, reliable elements - until then missing- about what impacts did one of the pillars of the environmental policy (the GELOSE law implementation) yield after nearly 2 decades of implementation. Along with that, the current work informs a better understanding of how well the above existing environmental policy framework function. These two aspects are crucial for future interventions in the environmental sector in which different market and performance-based payment mechanisms will be important. Indeed, it is unlikely that the country will be successful entering those mechanisms if the management of the natural resources at the grassroots level does not perform well.

D. PURPOSE AND ORGANIZATION OF THE REPORT

14. While most of the recommendations in this report can be extended to CBNRM in general, the analysis has focused specifically on CFM. The key steps leading in principle to the creation of a CFM contract apply (with some minor differences) to all CBNRM contracts. In fact, the GELOSE law applies to forest, terrestrial and aquatic fauna and flora, water and pasture land resources. We have focused on forest-related natural resources (GELOSE and GCF) because of the relative abundance of data which has allowed to conduct an original empirical analysis. In addition, CFM contracts constitute the majority of the contracts that exist in Madagascar.

15. The present work is targeted to decision makers and stakeholders involved in CFM policy with the objective of taking stock of almost 20 years of implementation and advise on future directions in policy formulation. CFM contracts have the potential to improve conservation of natural resources while improving local communities’ wellbeing. This potential, however, has been questioned (Behera, 2009) and its evidence base has been found to be weak (Bowler et al., 2012).

Many publications review the institutional and political aspects of Madagascar's forest decentralization process (Pollini et al., 2014; Pollini and Lassoie, 2011; Raik and Decker, 2007; Rives et al. 2013; Urech et al. 2013), but only a few focus on empirically estimating the performance of CFM in terms of conservation outcomes (e.g. CIRAD 2013; Sommerville, Milner-Gulland et al. 2010; Toillier et al. 2011) and human well-being outcomes (e.g. Hockley & Andriamarovololona 2007; Sommerville, Jones, et al. 2010; Toillier et al. 2011; Ramamonjisoa and Rabemananjara 2012). For the reasons mentioned above, high quality studies evaluating the effectiveness of CFM are therefore important for shaping future investments in community-based approaches to reduce deforestation. Specifically, the present work seeks to: (i) provide robust evidence on effectiveness of CFM at reducing deforestation and improving human well-being in Madagascar; (ii) identify the underlying causes of ineffectiveness of the policy; and (iii) sketch a number of policy recommendations.

16. The report is organized as follows. Section 2 provides the result of an impact evaluation analysis conducted on the application of CFM policy. Impact evaluation has been conducted on the two implicit objectives of the policy: (i) forest conservation; and (ii) community welfare. Results are opposite to the conventional wisdom on CFM as they portray a largely ineffective policy. Section 3 provides an analysis of the legal and institutional aspects of the application of CFM policy in Madagascar. It sheds light on the complexities of the policy, on the legislation and regulatory gaps, on the inconsistencies with other sector policies and on the complex balance of power between different stakeholders. Section 4 concludes with a number of recommendations for the short, medium and longer term. This report is intended as a primer for understanding the basic characteristics and challenges CFM policy faces in Madagascar. As such, it is not exhaustive. But it will hopefully invite more work in the area and a renewed interest by development practitioners.



II. EVALUATING THE EFFECTIVENESS OF COMMUNITY FOREST MANAGEMENT

17. This section uses impact evaluation as a tool to measure the effectiveness of CFM policy on two key variables: deforestation and well-being. Impact evaluation assesses the changes on a variable of interest that can be attributed to a particular intervention, such as a project, program or policy. To measure the impact of CFM policy on conservation we compared the extent of deforestation between CFM areas and similar non-CFM areas. To measure the impacts on people's well-being we used the annual household per capita consumption expenditure in CFM areas and compared to the level of annual household per capita consumption expenditure in similar non-CFM areas.

18. Assessing the effectiveness of CFM approaches comes down to answering the question: what would have happened if there had been no intervention? The literature on impact evaluation is vast, but useful references include Ferraro & Pattanayak 2006; Andam et al. 2008; Andam et al. 2010; Joppa & Pfaff 2010. In the real world, that is, outside of the controlled environment one can create in a laboratory, it is impossible to observe what would have happened in the absence of a given intervention. One approach is to infer it from other locations (this was done for the deforestation analysis) and from other households (for the well-being analysis) which are not exposed to the policy (Joppa & Pfaff 2010). Then, impacts of the policy could be inferred by comparing conditions in units with intervention (treated) and without intervention (untreated).

19. The analysis performed for this section aims at answering the following policy questions:

Objective 1: Has CFM policy reduced deforestation in Madagascar?

Objective 2: Has CFM policy improved human well-being, as measured by consumption expenditure?

With respect to the first policy question, the analysis aimed at measuring: (i) the overall effectiveness of the policy in reducing deforestation; (ii) test the sensitivity of the above result by looking at a subsample of CFM units that have passed the Government validation after three year of implementation; (iii) any difference in impact between CFM contracts that allow commercial use of forests and contracts that impose strict conservation. With respect to the second policy question, the analysis aimed at measuring: (i) the effectiveness of CFM at improving household economic living standard; and (ii) the spatial distribution of CFM benefits by looking at the heterogeneity of impacts as a function of household location relative to forest edges.

20. To conduct the analysis, and to ensure robust results, particular attention was given to address the following issues:

- The potential non-random assignment of CFM. CFM interventions are in all likelihood not randomly assigned. In fact they are often biased towards locations having characteristics more or less favorable to conservation and/or development. For example, CFM is more likely to occur in areas with higher human pressures (Ferraro & Pattanayak 2006; Bowler et al. 2012; Rasolofoson et al. 2015). Thus, comparing spatially-biased treated units with random untreated units biases impact estimates because the two groups differ in characteristics that are yet having confounding effects on the variable of interest (e.g. deforestation). It is like comparing “apples to oranges” (Joppa & Pfaff 2010). To solve this issue, statistical matching was used. Statistical matching consists in selecting untreated units that have characteristics most similar to treated units at pre-intervention baseline (Ferraro & Pattanayak 2006; Joppa & Pfaff 2010).
- The lack of baseline data (for the well-being analysis). Ideally, an impact evaluation using statistical matching should have baseline data gathered before the intervention was implemented. Those data are needed to control for initial conditions that may confound measures of intervention effectiveness (Ferraro & Pattanayak 2006). However, our study on well-being impact misses outcome baseline data. To address this issue, we perform the falsification or placebo test (Ferraro & Hanauer 2014) to demonstrate that treated and similar untreated units that are matched in terms of observable confounding characteristics have similar outcome values in the absence of CFM. If they do, we have higher certainty that matching observed confounding characteristics ensures that matched units have similar outcome values at baseline when there was no CFM intervention. If treated and untreated units have different outcome values in the absence of CFM, the chance is higher that they had different outcome values at baseline.
- The possible effect of unobserved variables. It is possible that the treated and the untreated subjects already differed at the baseline due to the effect of other variables than the observed ones. Sensitivity analysis was used in this work to assess the sensitivity of the results to such unobservable bias.

The text in the box provides further details.

Box. Impact evaluation and methods used for the deforestation and well-being analysis

Impact evaluation consists in isolating the impacts attributable to a given intervention (CFM implementation in our case) by comparing conditions in units with intervention (treated) and without intervention (untreated). If interventions were randomly assigned, comparing treated with random untreated units could reveal causal impacts of interventions, since randomness of both units would ensure similarity in environmental and socio-economic characteristics across these two groups of units (Joppa & Pfaff 2011). However, interventions are not randomly assigned in reality. They are often biased towards locations having characteristics more or less favorable to conservation and/or development. For instance, CFM is more likely to occur in areas with higher human pressures (Ferraro & Pattanayak 2006; Bowler et al. 2012; Rasolofoson et al. 2015).

Overall, described below are the key elements of the methods we used to conduct both analyses:

- 1) Matching was used to address the non-random assignment of CFM to the different units of analysis: this was conducted via a careful choice of covariates to ensure as precisely as possible that the only difference between the treated and non-treated units was the implementation or not of CFM. This step involved a careful choice of the covariates to be controlled between the two groups (the CFM and non-CFM). Those covariates were pressure and access-related (Appendix B, table B3) for the deforestation analysis and site and household characteristics for the well-being analysis (Appendix H, table H5).
- 2) While the forest cover map from 2000 was used as baseline data for the deforestation analysis, a falsification test had to be performed to address the lack of baseline data for the well-being analysis: it was aimed at demonstrating that both treated and untreated households did not differ in terms of well-being at baseline, in the absence of CFM (or to know the direction of the bias if the differences at the baseline cannot be controlled). The falsification test provides the percentage of the outcome variable (household expenditure in our case) for the treated units compared to the untreated ones. The results of the falsification test are associated with a level of significance (p-value).
- 3) Sensitivity analysis was conducted to check the robustness of the results to unobservable variables (i.e. the parameter from the sensitivity analysis), associated with a p-value, measures, the likelihood for unobservable variables to make the treated units receive the intervention (compared to observably similar non-treated ones) for the results of the impact analysis to remain significant (e.g. a Γ value of 1.2 at $p < 0.05$ would mean that the results of the impact evaluation analysis remains significant at p-value 0.05 even if unobservable variables make the treated units 1.2 times more likely to receive treatment than the observably similar units).

METHODS

21. Impacts of CFM on conservation were measured by the extent of deforestation having occurred between 2000 and 2010 in forests within and outside CFM areas. We used deforestation data developed by ONE et al. (2013). These are based on satellite images from Landsat TM and Landsat ETM+ and have a resolution of 28.5 meters and an accuracy rate close to 90 percent. Full methods are in Harper et al. (2007).

22. Information on CFM contracts was obtained from multiple sources. These include organizations involved in implementation of CFM such as the “*Direction de la Valorisation des Ressources Forestières*”⁸ (DVRF). Information was also obtained from the *Office National pour l’Environnement* (ONE), various NGOs that promote CFM, including *Asity*, *Fanamby*, Durrell Wildlife Conservation Trust, Conservation International, Wildlife Conservation Society, and World Wide Fund for Nature. In total, we counted 1248 CFM units with natural forest resources throughout the country (Appendix K).

23. The study sample included only CFM established between 2000 and 2005. This was mainly to allow at least 5 years of CFM implementation after the establishment of the contract. Undated CFM contracts and CFM established before 2000 or after 2005 were excluded from the sample. We also excluded protected areas managed by Madagascar National Parks, as these contracts are not comparable to the typical GELOSE or GCF contract. Finally, extensions of protected areas, temporary and new protected areas created since 2003, were excluded. However, any portions of these newly created protected areas that were known to be community managed were considered as CFM (see Appendix B Table B1 for how CFM, non-CFM and excluded areas fit into official Madagascar forest statuses since 2003). Table 1 provides a summary of the total number of CFM in the sample.

24. The analysis on the impacts of CFM on reducing deforestation was divided into three dimensions:

- Overall effectiveness of Madagascar’s CFM policy at reducing deforestation by looking at all CFM units across the country. We considered the entire sample, composed of contracts satisfying the eligibility criteria stated above.

⁸ DVRF is part of the Direction Générale des Forêts (DGF): most of the data we gathered from DVRF derived from Alexio Clovis Lohanivo’s Doctorate research. Before then, there was no nation-wide data about CFM in Madagascar.

- Effectiveness of CFM at reducing deforestation in a subsample of CFM units where we have information to suggest that CFM was fully implemented on the ground. Malagasy CFM contracts vary in their implementation quality. Some were established with little input from local communities (Rives et al. 2013), and others received little or no external support (Hockley & Andriamarivololona 2007). It is very difficult to get information on the implementation quality of the individual CFM projects. We looked at whether a CFM unit passed the forest department evaluation that is undertaken three years after the contract was signed (Pollini & Lassoie 2011) as an indicator of whether the project was indeed implemented. While not an ideal indicator, it does at least suggest the CFM unit has met the basic institutional, socio-economic and environmental criteria of the evaluation. We refer to units that passed the evaluation as CFM units that have information to suggest implementation.
- Effectiveness of CFM at reducing deforestation depending on whether CFM enables or prohibits the commercial use of forest resources. CFM implementation in Madagascar varies according to regulations related to commercial use of forest resources. Commercial CFM allows the sustainable exploitation of timber and adopts it as a conservation strategy. Non-commercial CFM contracts do not allow commercial uses and follow a pure conservation strategy (Randrianarivelo et al. 2012). Because there are no reliable national data regarding where commercial uses are permitted within CFM, we could conduct analyses on commercial and non-commercial CFM on four sites only, where we were able to ascertain information on commercial uses through field visits, interviews with site managers or search for existing literature. The four sites are *Didy*, *Tsitongambarika*, *Menabe* and *Boeny* (Figure 2). All CFM units that we considered in these four sites had passed the forest department evaluation. Table 1 indicates the number of CFM units, the area of land and natural forest covered by each type of CFM considered in our deforestation analyses.

Table 1. Number of CFM units and dimension of different types of CFM

Types	Study (scale)	CFM unit	Land area (ha)	Natural forest area in 2000 (ha)
All CFM	Madagascar	355	1,037,536	471,392
CFM with information suggesting implementation	Madagascar	143	497,019	262,982
Commercial CFM	<i>Didy</i>	8	29,104	23,409
	<i>Tsitongambarika</i>	12	18,089	7,214
	<i>Boeny</i>	7	30,920	10,768
Non-commercial CFM	<i>Didy</i>	8	40,164	32,757
	<i>Tsitongambarika</i>	4	3,757	866
	<i>Menabe Antimena</i>	4	22,042	13,991

25. Impact evaluation has been conducted with six comparison groups. Table 2 summarizes the data gathered. The first analysis compares forest dynamics in areas with CFM established between 2000 and 2005 to forest dynamics in areas without CFM (or non-CFM sites or areas, for brevity). The second compares forests in CFM areas that suggest implementation (i.e. evaluation completed by the forest administration) to forests in areas with no CFM. Note that non-CFM areas refer to forests that, up to 2010, were not technically and financially supported by particular organizations and thus were under government control. Since the government has been weak and unable to enforce forest laws, these forests are practically open access (Raik, 2007; Urech et al., 2013).

26. The four remaining comparisons are with regards to commercial and non-commercial CFM contracts. The third and fourth analyses compare, respectively, commercial and non-commercial CFM to non-CFM. The fifth and sixth compare commercial to non-commercial CFM, and vice versa. The difference between the fifth and sixth analysis rests upon the type of matching applied to the sampled pixels used in the comparison. The CFM forests where commercial use is permitted may be observably different from the CFM forests where such use is prohibited (in terms of the confounding factors). To understand how deforestation in commercial CFM forests would have been different without commercial use requires that we compare commercial CFM forests to non-commercial CFM forests that are observably similar at baseline (in terms of the confounding factors). So the comparison of commercial to non-commercial CFM uses an intervention group of all the randomly selected commercial CFM pixels and a comparison group of only the best matches of non-commercial CFM pixels. Dissimilar pixels from the non-commercial CFM sample are discarded. The estimate from this comparison represents the average impact of permitting commercial use on the types of CFM

forests where commercial use has been permitted. The impact of commercial use may be different on the types of CFM forests where commercial use has been prohibited. To estimate this impact, we formed an intervention group of all the randomly selected non-commercial CFM pixels and a comparison group of only the best matches of CFM-commercial pixels. Figure 2 shows CFM with natural forest resources, commercial CFM sites used for the analysis in this report, and non-commercial CFM sites.

27. The unit of analysis is a forested pixel from the 2000 forest cover baseline (See Appendix C for limitations of using 2000 baseline forest cover and CFM established between 2000 and 2005, and Appendix B for how we deal with potential pseudo-replication in which pixels within a particular CFM are not independent). For each forested pixel at baseline, covariates take the values of each confounding characteristic at that pixel location. For each analysis (Table 2), we selected random forested pixels in intervention areas. Then, we used matching⁹ to pair each randomly selected pixel with the most similar pixel in comparison areas in terms of covariates. The outcome variable is whether a pixel remained forested or not in the 2010 land cover. The estimated difference in deforestation between intervention areas and similar comparison areas represents the impact of the intervention on deforestation for intervention sites or the Average Treatment effect on the Treated (ATT). We used independent samples T-test to compare deforestation between intervention areas and similar or counterfactual areas.

⁹ One to one matching with replacement; Mahalanobis covariate matching because it better balances covariates than other matching algorithms.

Figure 2. Map showing CFM with natural forest resources, commercial and non-commercial CFM sites (Projection: Laborde Madagascar)

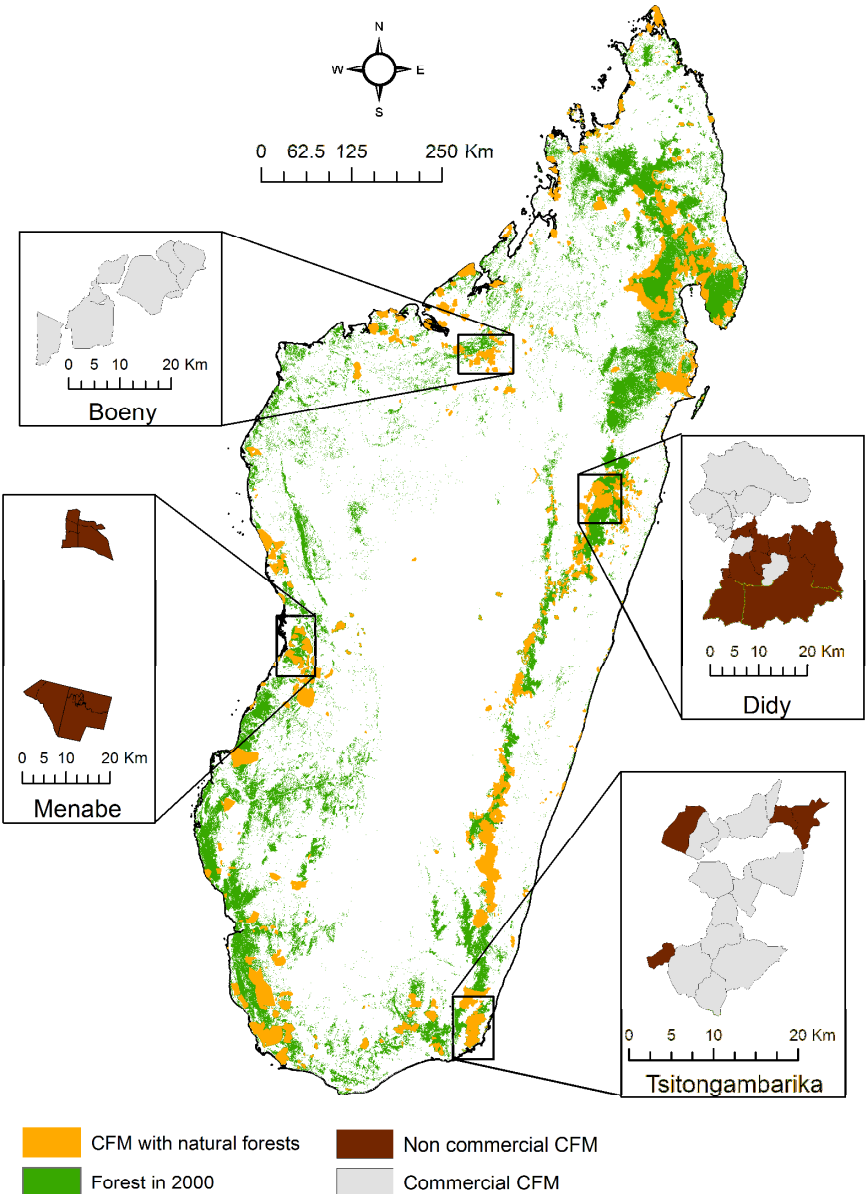


Table 2. Impact evaluation on deforestation: analyses conducted

Analysis	Intervention	Counterfactual	Estimated
Effectiveness of all CFM	All CFM	Non-CFM	Difference of deforestation between CFM and non-CFM had there been no intervention
Effectiveness of CFM with information suggesting implementation	CFM with information suggesting implementation	Non-CFM	Difference of deforestation between CFM and non-CFM had there been no intervention
Effectiveness of commercial CFM	Commercial CFM	Non-CFM	Difference of deforestation between CFM and non-CFM had there been no intervention
Effectiveness of non-commercial CFM	Non-commercial CFM	Non-CFM	Difference of deforestation between CFM and non-CFM had there been no intervention
Relative effectiveness of commercial and non-commercial CFM on the types of CFM forests where commercial use has been permitted	Commercial CFM	Non-commercial CFM	Difference of deforestation between actual commercial CFM forests and if these forests commercial use was prohibited
Relative effectiveness of non-commercial and commercial CFM on the types of forests where commercial use has been prohibited	Non-commercial CFM	Commercial CFM	Difference of deforestation between actual non-commercial CFM forests and if these forests had commercial use been permitted

28. We performed exact matching on vegetation zones (eastern humid, western deciduous and southern spiny forests, Appendix D Figure D1). We executed bias adjustment regression to correct for any remaining post-matching covariate imbalance (Abadie & Imbens 2006). We used the ‘matching’ package in R (Sekhon 2011).

29. We aimed to select sample sizes that balance our interests in achieving high statistical power and reducing computer processing time. Learning from multiple trial analyses, we decided on a sample of around 30,000 pixels for all intervention areas in each analysis. For comparison areas, we sampled around two to four times more pixels (Appendix B Table B2). The larger sample size from comparison areas increases the probability of finding a good match for each intervention pixel.

30. Before matching, we note a number of differences between the units of analysis, confirming non-random treatment. CFM pixels are, on average, located closer to recent deforestation, to a road and to an urban center, and are characterized by shorter trip durations to an urban center than non-CFM pixels. Although these patterns suggest CFM is assigned to areas of higher deforestation pressure, CFM is also located on lands less suitable for agriculture and on lands at higher elevation (Appendix B Table B5). Commercial CFM pixels are, on average, associated with lands more suitable for irrigated rice, closer to a village, a road and an urban center and are characterized by shorter trip duration to urban centers and higher population density. However, they are located on lands less suitable for agriculture and on steeper slopes than non-commercial CFM sites (Appendix B Tables B9, B10).

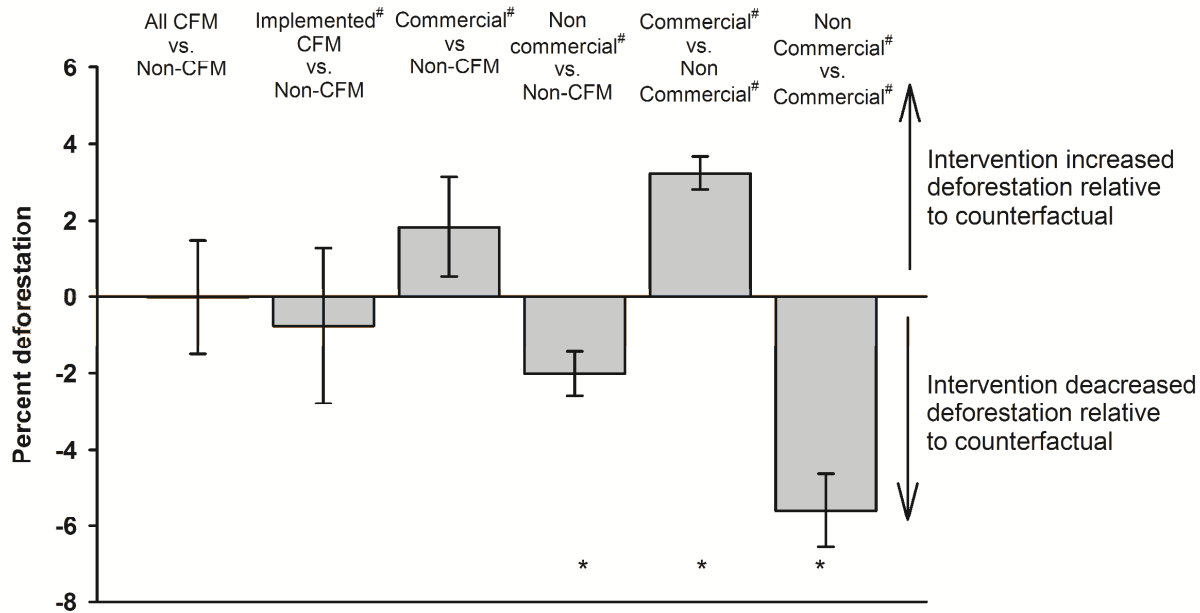
31. Matching generally improves covariate balance. The mean differences and the mean raw eQQ differences¹⁰ of covariates in intervention and counterfactual areas tend toward zero after matching (Appendix B Tables B5 – D10). An exception is the suitability for agriculture in the comparisons of commercial and non-commercial CFM, and vice versa. Matching does not improve balance for this factor (Appendix B Tables B9, B10). This is because all suitable lands for agriculture are found only in the non-commercial CFM in Menabe. Thus, there are no matched suitable lands in commercial CFM. We describe potential effects of this imbalance in the discussion.

32. The results of the analysis are robust and suggest no significant impact of CFM on deforestation. Between 2000 and 2010, CFM sites had, on average, 0.02 percent less deforestation than matched non-CFM sites, a statistically insignificant difference ($p = 0.89$, Figure 3). When we consider only CFM with information suggesting implementation, CFM had 0.71 percent less deforestation than matched non-CFM, but still statistically insignificant ($p = 0.78$). Differentiating CFM by whether commercial uses are allowed, we estimate that commercial CFM experienced 1.83 percent more deforestation than matched non-CFM ($p = 0.16$). Non-commercial CFMs reduced deforestation by 2.01 percent relative to matched non-CFM ($p < 0.001$). When we compare commercial CFM to matched non-commercial CFM, to investigate their relative effectiveness on the types of CFM forests where commercial use has been permitted (i.e., forests on lands more suitable for irrigated rice, closer to a village, a road and an urban center, shorter trip duration to urban center, higher population density), commercial CFM experienced 3.24 percent more deforestation ($p < 0.001$). Comparing non-commercial CFM to matched commercial CFM, to investigate their relative effectiveness on the types of forests where commercial use has been prohibited (i.e., forests on lands

¹⁰ Mean eQQ is a measure of the difference between two distributions and in our case it is used to see if the treated and untreated samples used for impact evaluation are similar enough at baseline. Strictly speaking, eQQ is the difference of the raw differences in the empirical quantile-quantile plots.

less suitable for irrigated rice, farther to a village, a road and an urban center, longer trip duration to urban center, lower population density), we found that non-commercial CFM reduced deforestation by 5.59 percent ($p < 0.001$, Figure 3).

Figure 3. Differences in percent deforestation between intervention and counterfactual¹¹.



33. Table 3 presents the results of the sensitivity of our analyses to hidden bias (i.e., an unobservable covariate). For example, where the parameter Γ is 1.38, the estimate of 2.01 percent remains significantly different from zero at a p value of 0.05 even if unobservable covariates make non-commercial CFM pixels 1.38 times more likely to receive intervention than non-CFM pixels. In other words, unobservable covariates need to increase the likelihood of the non-commercial pixels to receiving intervention by a factor greater than 1.83 in order for the impact estimate to be statistically insignificant from zero.

Table 3. Sensitivity tests to unobservable covariates

Analysis	Critical Γ at $p = 0.05$
Non-commercial CFM vs. non CFM	1.38
Commercial CFM vs. non-commercial CFM	1.50
Non-commercial CFM vs. commercial CFM	5.85

¹¹ #CFM for which we have information to suggest implementation, * significant at $p < 0.001$, error bars: standard errors for post-matching estimates that are calculated using a variance formula that is robust to heteroskedasticity and adjusts the variance estimator for repeated matches among control units (Abadie and Imbens, 2006)

METHODS

34. The variable used to measure the impact of CFM policy on welfare is the annual household per capita consumption expenditure. This measure comes from two sources of data collected by the National Institute of Statistics of Madagascar (INSTAT): (i) Enquête Périodique Auprès des Ménages 2010 (EPM 2010); and (ii) Enquête Nationale sur le Suivi des Objectifs du Millénaire pour le Développement à Madagascar 2012 (ENSOMD 2012). The two sources provide comparable data as they used similar questionnaires and were designed to monitor households' well-being throughout Madagascar. EPM 2010 surveyed a nationally representative random sample of 12,460 households. ENSOMD 2012 was carried out on 16,920 randomly selected households. Thus, together they collected data on randomly sampled 29,380 households throughout Madagascar. Household per capita consumption expenditure from EPM 2010 and ENSOMD 2012 comprise food, non-food consumption, durable goods and housing expenditure that were aggregated following methods in Deaton and Zaidi (2002). We adjusted for regional and temporal differences in prices and converted to 2005 international dollars.

35. The unit of analysis is a household, and the sample has been constructed as follows. We only considered CFM established before or in 2007 for EPM 2010 and before or in 2009 for ENSOMD 2012 to allow reasonable time for impacts to take place (i.e., 3 years), which corresponds to the first evaluation of the CFM¹². Among the sampled households, the numbers of treated and untreated households in our analyses are shown in table 4. CFM (treated) households are those located within a commune that has 10 percent or more of its area covered by CFM. As our results may be sensitive to this arbitrary 10 percent threshold, we performed an analysis at 25 percent threshold as a sensitivity test. Non-CFM (untreated) households are those located within a commune that has less than 1 percent of its area covered by CFM. This is to make sure that potential impacts of CFM are minimal, if any, in non-CFM households. We excluded from the analyses households that are located within a commune that has between 1 percent and 10 percent of its area covered by CFM. Households within communes, with less than 5 percent of forest areas and urban households, were excluded. We used the percentage of the area of a commune covered by CFM as threshold to designate CFM and non-CFM households because CFM impacts may extend well beyond CFM boundaries, which only include the community managed forests and do not include the areas inhabited by the managing communities in certain cases. The commune is also one of the signatory parties defined by the

¹² The choice of the 3 years of implementation was based on the fact that according to the GELOSE law, any CFM contract has to be evaluated after 3 years from its signature before it can be renewed, suggesting that some tangible progress should be recorded within this timeframe.

GELOSE law. It also receives taxes from commercial use of forest resources in CFM that permits such activity (Randrianarivelo et al. 2012). Improved or degraded ecosystem services provided by the community managed forests may also affect the well-being of people beyond CFM boundaries.

Table 4. Numbers of treated and untreated communes and sampled households

	Commune		Household	
	Treated	Untreated	Treated	Untreated
Threshold 10 percent CFM cover of the commune				
2010	83	319	698	2,179
2012	107	303	760	1,938
Total			1,458	4,117
Threshold 25 percent CFM cover of the commune				
2010	31	319	115	2,179
2012	44	303	303	1,938
Total			418	4,117

36. The analysis of CFM policy impacts on welfare has been performed by conducting three groups of comparisons:

- The first analysis compares households in communes that have more than 10 percent of their area under CFM with households in communes with no CFM (households that are similar in terms of the site and household confounding characteristics, located within a commune that has less than 1 percent of its area covered by CFM).
- The second analysis compares households in communes with more than 25 percent of their area under CFM with non-CFM households.
- The third comparison checks for an eventual heterogeneous impact of CFM. To reflect the potential heterogeneity of impacts as a function of household location (spatial distribution of impact), we divided the sampled households into two subgroups: households within 3 km from forest edge and households beyond 3 km from forest edge. We then investigated CFM impacts in the subgroup within 3km from forest edge. We could not do the same for the subgroup beyond 3 km from forest edge because there are not enough comparable non-CFM households for the analysis to be carried out.

37. Before matching, CFM and non-CFM households do not differ much in terms of household characteristics (Appendix E). In contrast, the differences between CFM and non-CFM households are large for some site characteristics before matching. CFM communes have more forest area and percentage of forest area, on average, than non-CFM communes (30,166 hectares vs. 18,558 hectares and 34.7 percent vs. 24.7 percent). CFM communes also have, on average, less road-less and cart trackless volumes than non-CFM communes (8,084 km³ vs. 8,722 km³ and 2,214 km³ vs. 2,352 km³ respectively). CFM communes are less densely populated than non-CFM communes on average (34.7 vs. 38.6 inhabitants per km²). Finally, CFM communes are located in shorter trip duration to urban center than non-CFM communes (19.6 vs. 31.3 hours) (Appendix E).

38. Overall, matching improved covariate balance. This is shown by the post-matching mean differences and mean raw eQQ differences of covariates in CFM and non-CFM households (Appendix E).

39. The results of the work are robust and suggest that there was no significant impact of CFM in improving households' livelihoods, except for those who live within 3km from the forest edge. The result of the falsification test suggests that CFM households had 0.56 percent (US\$ 1.71) less per capita consumption expenditure than non-CFM households in the absence of intervention, a result that is not statistically significant (p. 0.97) (Table 6). The analysis, in which CFM households are those located within a commune that has 10 percent or more of its area covered by CFM, shows that CFM increased per capita consumption expenditure of CFM households by 4.33 percent (US\$ 12.57) relative to non-CFM households, a difference that is not statistically significant (p. 0.43). When the threshold is brought up to 25 percent, this difference increases to 6.00 percent (US\$ 18.53), which is still not statistically significant (p. 0.52). Finally, we found that CFM improved per capita consumption expenditure of CFM households by 18.55 percent (US\$ 51.42) (statistically significant, p. 0.03) in location nearer to forest edge (Table 5).

Table 5. Estimates of impacts of CFM on annual household per capita consumption expenditure from the different analyses:

Analysis	Impact in percent	Impact in US\$	p.value
Falsification test	-0.56	-1.71	0.97
Threshold 10% CFM cover of the commune	4.33	12.57	0.43
Threshold 25% CFM cover of the commune	6.00	18.53	0.52
Within 3 km from forest edge	18.55	51.42	0.03**

**significant at 0.05

40. The analysis suggests that decentralization of forest management to local communities in Madagascar may not have, on average, achieved its forest conservation goal. In terms of deforestation, we cannot detect an effect, on average, of CFM compared to non CFM, even after restricting the sample to sites where we have information to suggest CFM implementation on the ground (i.e. where the CFM has passed the forest administration's evaluation three years after establishment).

41. While CFM might have failed, on average, to reduce deforestation relative to non-CFM, non-commercial CFM appear to have had more success, albeit a small one. Putting all types of CFM in one basket would lead to the conclusion that CFM is not an effective approach to reduce deforestation, obscuring the positive impact non-commercial CFM appear to have had. This result emphasizes the importance of differentiating among types of CFM in evaluation (Lund et al., 2009). Potential mechanisms through which non-commercial CFM may have had relatively more success are complementary direct payments for conservation. Some non-commercial CFM in our work sites in Didy, Tsitongambarika and Menabe practiced direct payments to conservation schemes to offset restrictions introduced by interventions (e.g. Brimont and Bidaud, 2014; Sommerville, Milner-Gulland, et al. 2010).

42. Commercial CFM tend to increase deforestation compared to non-commercial CFM. The estimated reduction in deforestation from non-commercial CFM is important given that the role of commercial use of forests in conservation is subject to much debate in theoretical and empirical studies. Some studies argue that by assigning value to forests, commercial use provides means and incentives for local communities to protect forests, while others show that it can trigger the destruction of the resources being commercialized (Agrawal & Chhatre 2006; Persha et al. 2011). Our findings do not support the argument that permitting commercial extraction can enhance the deforestation-reducing impacts of CFM.

43. Our measure of the relative performance of non-commercial CFM vis-à-vis commercial CFM is conservative. Our matching algorithm was unable to remove the pre-matching difference between commercial and non-commercial CFM in terms of agriculture suitability (Appendix B Tables B9, B10). After matching, commercial CFM has lower suitable lands for agriculture (0 percent) than non-commercial CFM (29 percent). However, knowledge of the direction of the effect of agriculture suitability on deforestation allows us to infer the implications of the post-matching imbalance. Gorenflo et al. (2011) show that lower suitability for agriculture is associated with lower deforestation rates in Madagascar. Thus, the post-matching imbalance should occasion lower deforestation in commercial CFM than non-commercial CFM. Therefore, if matching had balanced the suitability for agriculture between the two types of CFM, commercial CFM performance relative to non-commercial

CFM would have appeared even worse because the lower deforestation occasioned by the lower land suitability in commercial CFM would have been erased. Our estimates of impacts for commercial versus non-commercial CFM, and vice versa, are thus conservative.

44. At the national level, our findings substantiate the rather gloomy pictures of CFM in Madagascar depicted in a number of institutional and policy studies. See for example Pollini et al., 2014; Pollini and Lassoie, 2011; Raik and Decker, 2007; Rives et al., 2013; Urech et al., 2013. To explain the ineffectiveness of CFM, these studies describe inadequate integration of local participation, resource capture by elites, unfulfilled support promises by different organizations, and lack of capacity of the community and state, among other factors. A recent empirical study (CIRAD, 2013) is of particular interest because it also looked explicitly at the impact of CFM on deforestation and covered part of our study areas, and its results contradict ours. It found that deforestation was significantly less in CFM than in areas without community conservation. It also shows that commercial CFM was more effective at reducing deforestation than non-commercial CFM. The results are not directly comparable to ours because the analyses cover a different time period and are at a different spatial scale, but the CIRAD study should be interpreted with care because it did not adequately control the biases in confounding factors as we do here. Failure to adequately control such biases can result in incorrect impact estimates (Andam et al. 2008; Joppa and Pfaff, 2011).

45. The transfer of forest management rights to local communities has not improved household economic living standards in Madagascar at larger scale (Municipality level). However, CFM has enhanced the economic living standards at a smaller scale, for households living along forest edges. We have some confidence that our findings are robust to the missing baseline outcome or any other unobserved confounding characteristics because the falsification test shows that, in the absence of CFM, the household per capita consumption expenditure levels are similar in CFM and non-CFM households.

46. Our finding that CFM improved local livelihoods of household along forest edges lends support to some previous studies in other developing countries. For example, Bandyopadhyay & Tembo (2010) study on the participation of local communities in game management areas in Zambia recorded higher per capita consumption expenditure for households living in the management areas. Other studies show that households have better livelihoods by participating in local forest user groups (Bandyopadhyay and Tembo 2010, Ameha et al. 2014, Gelo and Koch 2014). However we could not investigate the impacts on those explicitly participating in forest user groups (i.e. VOI members in Madagascar) because our data did not allow us to differentiate between participant and non-participant households.

47. One of the contributions of this report to the literature on CFM impacts in Madagascar is the careful control of site and household characteristics. Most of the existing Madagascar specific literature takes a case study approach. As such, earlier studies have benefited from locally specific information, allowing them to provide a crispier picture at the site level. Our study, which is based on national level surveys that were not originally intended to evaluate CFM impacts, has probably failed to take into account some relevant dimensions of the CFM universe. Data from EPM 2010 and ENSOMD 2012, while nationally representative, may not be representative of communities affected by CFM. It may be the case that certain types of forest households are underrepresented in the samples. Therefore our findings should be interpreted with caution.

48. Some caveats are in order. In particular, we should not disregard the context of the period covered by the analysis. VOI experienced many difficulties during the period 2005-2010 to exercise their prerogatives. For example, commercial use of forest products was prohibited from VOI forests between 2000 and 2007, then, they were suspended multiple times (in 2008, then in 2011 and 2014), by means of various ministerial notes suspending commercial activities. As a consequence, there were very few of these lawful activities that could be conducted, resulting in potentially lower incomes for farmers (Rahajason et al. 2014).

49. Caution should be taken related to the 3-year implementation of CFM, taken as threshold in the welfare analysis. Although based on the GELOSE law, the 3-year implementation of CFM might be not enough to reflect tangible positive outcomes, especially in economic terms for the households. It is possible that changing the number of years of implementation would yield more positive results, however, due to data limitation, the team could not conduct sensitivity analysis by increasing this threshold: already, only 5,575 out of the 29,380 households in the initial database could be used for the analysis; increasing the threshold would have meant losing a lot more cases (and the related valuable information).

50. The negative performance of commercial CFM should not directly imply a failure of CFM, as other forces might be at play. Commercial use of forests would usually lead to the degradation of forests, and not to deforestation (exploitation of natural forest by clear-cutting is prohibited, including in CFM). Deforestation at the scale of a 28.5m x 28.5m pixel¹³ implies a regression of the wooded canopy which can only be obtained by clearing, usually driven by a conversion of forest to farmland, wildfires or fires to show discontent. That conversion to cropland that might have been at

¹³ The spatial resolution of the analysis is 28.5m; ONE resized the Landsat images (originally at 30m resolution) to have 28.5m pixels. Each pixel was then classified in one of the following categories: natural forests, mangroves, tapia forests, water, cloud, cloud shade.

play is supported by the welfare impact results. In fact, it is possible that the increase in consumption may also (and especially) come from the conversion of forest lands into agricultural lands. The economic profitability of forest land converted to cropland is for the most vulnerable households highly profitable in the short-term, even compared to the commercial use of the forest (Ramamonjisoa, 2001¹⁴) without securing land tenure. Without forest control, sustainability of forested land is difficult to achieve as long as the forest constitutes a reserve of fertile suitable agricultural land. In all cases, the significant results of the adverse impact of CFM and the commercial use of forests on deforestation seem to primarily express the inability of the VOI to enforce rules on members of the community (VOI members, the *fokonolona* or the migrants).

51. A more systematic analysis of CFM policy impacts should aim at identifying the factors of the mixed performance. Many factors can influence effectiveness of CFM (Agrawal 2003). We focused on the potential role of commercial use of forest resources (and given our study area, the potential that complementary direct payment for conservation could have on non-commercial CFM). Another potential moderating factor is the amount of resources invested, which may explain the apparently better performance of non-commercial CFM in comparison to commercial CFM. During our visit to *Didy*, officials in areas with commercial CFM complained about receiving smaller resources compared to their peers in neighboring non-commercial CFM areas (implemented by different organizations with different funding). However, we lacked quantitative information on spending to allow this potential moderator of success to be included in the analysis. Data regarding additional sources of finance will also offer opportunities to extend our study by exploring CFM cost-effectiveness in the future. Our findings also suggest that differentiating among types of CFM is important when evaluating effectiveness. Availability of information on institutional arrangements, degree of power devolved to local communities, and forest physical characteristics will allow more differentiation among types of CFM and thus will shed more light on the factors that promote effective CFM. Future studies that collect and use information on the eight design principles of robust, self-governed common-pool resources institutions of Ostrom (2000) (Appendix O), will be a first step toward exploring factors that make CFM effective.

¹⁴ Importance of '*filières*' for the development of zones where swidden agriculture is practiced. Contribution text at the BEMA EPB workshop "Culture sur brûlis: vers l'application des résultats de recherche" Antananarivo. 26 – 28 March 2001, 13 p.

III. UNDERLYING DRIVERS OF CFM INEFFECTIVENESS: LEGAL AND STAKEHOLDER ANALYSIS

52. The impact evaluation in the previous section points at the potentially poor performance of Madagascar's CFM both in terms of conservation and welfare. This in spite of the long lasting experience accumulated in the country's almost 20 years of CFM policy application. As noted above, Madagascar has been one of the first southern hemisphere countries to have put in place an original legal framework for CFM (Andriantsilavo et al., 2006. Montagne et al., 2007). The analysis showed that CFM did not have significant impacts on reducing deforestation. It may actually have had perverse effects in CFM sites allowing the commercial use of forest resources. The analysis also showed that CFM did not have significant impacts on reducing poverty, excluding perhaps for those individuals living closest to forest edges.

53. This section analyzes the underlying drivers of this apparent ineffectiveness of CFM, mainly from a legal and institutional perspective. Background work has been undertaken to systematically review the legislation on CFM in Madagascar and the sector legislation that is directly or indirectly linked to the practice of CFM. This has been accompanied by an analysis of the policy's actual implementation by relevant stakeholders, and by a stakeholder analysis looking at their relevance and power to influence policy outcomes. Due to resource limitations, the analysis of the actual implementation of CFM is necessarily limited. The section on recommendation offers some avenues for further analytical work.

54. In general, there are four main underlying drivers of ineffectiveness of the policy. The first one is that GELOSE law, which is the pillar of CFM in Madagascar, has never become fully functional as it was never complemented by all the required implementation decrees. This regulatory gap is also combined with the internal contradictions present in other legal texts on forest areas. The second driver is found in the lack of consistency between different sector's laws and policies and the CFM policy. This opens the way to conflicts and ineffectiveness. Thirdly, different actors involved in CFM implementation have different objectives that are not necessarily compatible, but also not necessarily compatible with CFM objectives in general. And last, law enforcement and the rule of law present substantial weaknesses both at the local and at the national levels. They are described below.

A. AN UNFINISHED CFM REGULATORY BODY

55. Law 96-025, known as GELOSE, occupies a central role in the application of CFM in Madagascar. The law was introduced after acknowledging that the participation of local communities in the management of forest resources and renewable natural resources in general was crucial for achieving better conservation results. The law is based on the principle that sustainable use of resources and land tenure security are crucial for improving local communities' well-being, hence

ensuring their engagement. The law foresees the establishment of a contract between three parties: (i) the owner of the resource, be it the State or a local or regional authority, ultimately responsible for the conservation of natural resources; (ii) a group of individuals from the local community legally grouped in an entity called *Vondron'Olona Ifotony* (VOI¹⁵); and (iii) the municipality, responsible for planning at the local level.

56. CFM is effectively a delegation of a public service emanating from the State in favor of VOIs.

In fact, according to Law 97-017, text of reference of the forest policy¹⁶, the forest administration exercises over the whole national territory of Madagascar a mission of public service of sustainable forest management. Through contracts, the VOIs agree to fulfill this public service mission on behalf of the State, under conditions negotiated by mutual agreement¹⁷. Hence through GELOSE, CFM is intended as a form of 'decentralization', in terms of delegation of the management of forest resources from the central Government to local actors (Aubert et al., 2015).

57. A first issue is that while GELOSE requires the application of multiple decrees and regulations, these regulatory efforts remain unachieved to date. GELOSE covers forests, wild terrestrial and aquatic fauna and flora, water and the transition land areas (art. 2). Depending on the type of resource, it is the responsibility of the relevant Ministries and local authorities to establish, through legal and regulatory provisions, the law's implementation modalities (art. 56). However, only the forest administration has so far produced an implementation text through Decree 2001-122 known as "*Gestion Contractualisée des Forêts*", meaning the "Management of Forests under Contracts", or GCF. The decree establishes the conditions for the implementation of community-based management of State forests. In practice, all 1,248 CFM contracts existing to date are contracts for which the State considers itself the resource owner¹⁸.

58. The intended cohesion between 'legal' and 'legitimate' resource use rights also remains unachieved. In issuing the GELOSE, the legislator has done an unprecedented effort to recognize both the customary rights of populations in their 'terroir' (art. 1), and the ultimate property rights of the State or decentralized authority (art. 2). For this association between 'legitimate' and 'legal' rights

¹⁵ The assumption under GELOSE was that the VOI would include a big part of the *fokonolona*, which would provide legitimacy within the community for its purpose and actions. In fact, originally, it was intended to use the term *fokonolona* itself. However, the proposition was rejected at the time by the parliament because of its semantic vagueness (Bertrand et al., 2014).

¹⁶ Before this law was published, forest rights were governed by the related decree issued on 25 January 1930.

¹⁷ Special management delegation to VOI: According to GELOSE law, sustainable use of renewable natural resources constitute the ultimate objective of CFM contracts (art. 1). Likewise, the 2001-122 decree on the GCF, puts the CFM in place for the VOI to be accountable of the management of forest resources, along with forest policy orientations and objectives (97-1200 decree), in conformity with the Malagasy Environment Charter (90-033 law and its subsequent revised texts).

¹⁸ However it is not always true, the State considers itself as the owner of the resources. There is there confusion between the forest administration's public service mission and the presumption of property of the resources.

(Aubert, 2002) to work, the law requires: (i) the intervention of an environmental mediator, whose role is to ensure that all stakeholders involved in the negotiations are given equal weight, given the divergent interests at play (decree 2000-028)¹⁹ but also to ensure the long term viability of CFM contracts; (ii) the possibility of providing relative land tenure security, after joint delineation of the land subject to management delegation (Decree 98-610); and (iii) the responsibility of the Municipality "*within the jurisdiction of which the resources, object of the application of transfer of management are located*" in the definition and implementation of its territorial development policy. These three principles, however, have not been integrated in the GCF decree. In addition, the decree was never published in the Official Journal of the Republic of Madagascar (JORM) and thus remains not enforceable against third parties. In practice, it is common to make the distinction between GELOSE-based CFM relating to the provisions of the law, and GCF-based CFM responding to the regulatory provisions. The later now accounts for the majority of CFM (Cf. distribution map in Appendix G).

59. Thirdly, the gap in implementation texts also opened the way to inconsistencies between the principles of the GCF decree and other texts, particularly those dealing with conservation. One such inconsistency is found between the GCF²⁰ text and the protected areas codes (COAP) of 2001 which (art.19 and art.20) does not include the possibility of implementing CFM in protected areas (in the controlled settlement zones, in the controlled utilization zones, or the peripheral zones). This allowed organizations delegated to manage new protected areas to have substantial latitude in creating ad hoc CFM contracts, tailored to the organization's objectives and falling outside of the general principles established by the GCF decree and the GELOSE law (Bertrand et al. 2012). This lack of coherence has been fueled by the financing decisions of the international community, notably the donor community and the international NGOs, and their selective support to the development and conservation agendas over the years. These emphasized: (i) the support to a conservation agenda that largely neglected the productive use of natural resources in spite of the inevitable demand of timber and non-timber forest products at the local, national and international levels (Bertrand et al., 2009); (ii) the support to a land tenure reform that has focused exclusively on agricultural land, neglecting the issue of land tenure security for forested lands²¹.

60. Absence of implementation texts not limited to the GELOSE law. The absence of implementing texts is not uncommon for forest and environmental laws and this makes interpretation

¹⁹ In 2002, a committee of environmental mediators, chaired by the general secretary of the Ministry of environment was put in place. Forty-four environmental mediators were officially recognized. However, since then, none of the licenses or national lists of environmental mediators were updated.

²⁰ The forest administration conceives the delegation of forests management to the VOI for "*domanial forests, classified forests, forest stations, planted forests, and, in the protected areas, in the controlled settlement zones, in the controlled utilization zones, or the peripheral zones*" (art. 5 of the 2001-122 decree), in other terms, forests under forest land reserve status.

²¹ GELOSE had made forest land tenure security a pillar of community based management.

of the laws, notably vis-à-vis CFM, particularly difficult. The background analysis of the five texts referenced in table 6 showed that only 7 implementing decrees were enacted and 17 legislations (laws, decrees or orders) are not yet subject to publication.

Table 6: State of the publication of the decrees for the implementation of the main legal texts relating to the CFM

Reference text	Published implementation texts (Title and number)	Implementation texts remaining to be published (Title and number)			
96-025 law (GELOSE)	Decree on environmental mediators	03 Decree on multi-sector resources Decree on the list of transferable resources Laws, decrees, other texts defining parafiscal advantages granted to the VOI Decree on GCF Order establishing the standard template for CFM application of to the commune	05		
	Decree on the VOI				
	Decree on land tenure security ²²				
97-017 law (Forest policy)	Decree on timber logging			Decree on the inventory of National forest domain (NFD)	06
				Decree on forest products list	
				Order on the management of the National forest Fund (FFN)	
		Decree on the delegation of management of State forests			
		Order on rate and taxes from timber logging and their related implementation conditions.			
	Decree on delegation of management	Decree on types of valorization and percentage in the delegated sites			
Law 2001-005 (former COAP)	Decree on law enforcement (aside from institution of New Protected areas texts)	01 Decree on procedures for creating new protected areas	01		
Act 2015-005 (COAP)		Order for the procedure to create new protected areas	05		
		Decree on procedures modalities for change of status			
		Decree on the content of the requirements specifications			
		Decree on the composition of the advisory body			
		Decree on mining compensation modalities			
Ordonnance 60-128 (Infractions)	Decree laying down detailed implementing rules	01	00		

²² Although the 98-610 decree of August 13 1998 sets land tenure securing as implementation of the 90-033 law, related to the environment charter, modified by the 97-012 law of June 06 1997, its art.2 explicitly states that land tenure securing is for implementing the GELOSE law 96-025.

61. Figure 4 and Table 7 provide a comprehensive view of the key inconsistencies between GELOSE and other texts and among CFM relevant texts. The review undertaken for this report conducted an analysis of 1 decree, 4 laws (including the 2001-005 law, repealed and substituted by the 2015-005 law on the new protected areas code COAP) and 6 implementing decrees for forest and environmental law (Appendix L).

62. Inconsistencies can be noted at two levels: between the 4 laws and between the laws and the implementation decrees:

- Between the laws. The major inconsistencies include: (i) under the GELOSE law, the management of certain categories of resources²³ can be transferred to the VOI; however, neither the forest law, nor the GELOSE law provide any list of those resources; leaving things open to interpretation, which, in turn, might become source of confusion; (ii) the infractions law (60-128) does not have any provision related to the liability regime for the VOI; (iii) the COAP law (2015-005), in its art.19 and art.20 do not state any provision for implementing CFM in protected areas, as the art.5 of the GCF decree suggested²⁴. This would constitute a step back for the implementation of CFM.
- Between the laws and the different implementation decrees. Many inconsistencies exist between the laws and the related implementation decrees but the major ones include: (i) the complete omission of the use of the service of an environmental mediator and the land tenure securing in the GCF decree despite the provision in the GELOSE law and its importance for having an effective implementation of CFM; (ii) one of the main purposes of GELOSE is to provide VOI with the possibility to earn economic profits from the management of the resources in return of the delegation of public service they accepted. Although decree 98-782 on forest management provides the possibility for the economic valuation option, its art.4 explicitly requires training certification (or diploma attesting that the person has the right expertise and experience in the activity) for any individual who wishes to be issued a forest harvesting authorization. Furthermore, it does not specify any guidance on what would be the equivalent of those trainings to VOIs; this limits considerably the likelihood for VOIs to benefit from these activities; (iii) the prohibition for the VOI to confiscate illicit products by the infractions ordinance also goes against the provisions in the GCF decree; a related risk is the impunity of authors of infractions.

²³ Under the GELOSE law, the management of forest, terrestrial and aquatic fauna and flora, water and pasture land resources can be transferred to the VOI.

²⁴ The forest administration conceives the delegation of the management of the forests to the VOI in the “*domanial forests, classified forests, forest stations, planted forests, and, in the protected areas, in the controlled settlement zones, in the controlled utilization zones, or the peripheral zones*” (art. 5 of the 2001-122 decree); in other terms, forests under forest land reserve status.

- Between the implementation decrees. Of the many inconsistencies between the different implementation decrees, we can enumerate: (i) the complete absence of land tenure securing in the GCF decree although it is present in the 98-610 decree about land tenure securing, which is also an implementation decree of the GELOSE law; (ii) the GCF decree, with the provision for VOI to sub-contract timber-harvesting activities to professionals, is in contradiction with the decree 98-782 on timber harvesting, preventing any sub-contracting possibilities under a management contract scheme; lastly, (iii) under the forest law, the incentives for valorizing forest products from CFM is complicated to implement because the implementation text²⁵ is missing.

²⁵ Under the Delegation of management, (2013-785) decree, an ‘arrêté’ for implementation, related to the types of valorization and the percentage of the derived income to the national forest fund by the delegated manager of the resources.

Figure 4: the relationship between the principal laws and decrees of the CFM

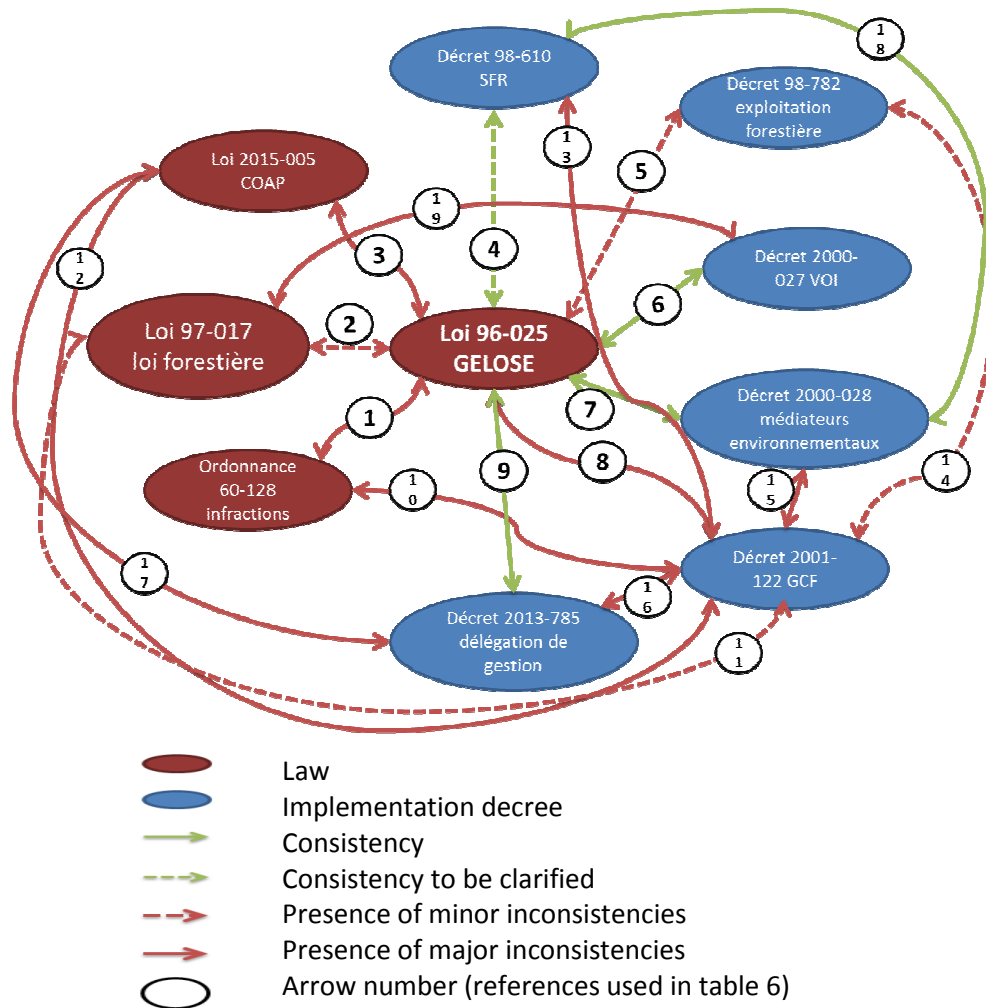


Table 7: Summary of the consistencies between texts on the forest law, environment rights and the CFM

Reference texts	Consistency	Consistency to clarify	Minor inconsistencies	Important inconsistencies
GELOSE	<p>6_ respect of the Law provisions.</p> <p>7_ respect of the Law provisions</p> <p>9_ Acknowledgement of GELOSE as a derogation to other terms of management delegation.</p>	<p>4_ land tenure securing (SFR) is possible under CFM but it is almost never used because the decree is not well known. Possibility for SFR to be revised and inserted in the law.</p>	<p>2_ list of forest products to be established by the administration to know what resources can be subject to management transfers under CFM; necessity to develop national forest management plans.</p> <p>5_ lack of special training provisions for VOI, especially related to forest harvesting under CFM.</p>	<p>1_ liability regime of the VOI non-specified in decree</p> <p>3_ imprecisions on the feasibility of CFM in the AP.</p> <p>8_ major contradictions: absence of regulator; low accountability of the commune</p>
GCF			<p>11_ links between the two texts to clarify: GCF Decree, Law 97-017?</p> <p>14_ requirements for VOI, related to harvest to clarify (trainings); contradictions on the possibility of sub-contracting.</p>	<p>10_ the decree authorized the possibility for members of the VOI to confiscate caught illegal products from the offender.</p> <p>12_ feasibility of implementation of CFM in Protected areas.</p> <p>13_ contradictions on the procedures and the entity providing the mediation, arbitration and conciliation.</p> <p>15_ environmental mediation ruled out.</p> <p>16_ if GCF decree is implemented from the 97-017 law, decree No. 2013-785 wouldn't allow the establishment of GCF contracts</p>
Other texts	<p>18_ complementarity between the two texts particularly in relation to relative land tenure securing (SFR)</p>			<p>17_ existence of retroactive provisions, questioning the legal situation of protected areas' delegated managers.</p> <p>19_ weak participation of the VOI in the forest commissions, at the national and regional level forest commissions</p>

NB: Refer to the arrows in figure numbers

All of these inconsistencies within the forest and the environment have contributed to make the implementation of CFM difficult, despite the legislator's good intentions at the time of preparation of the GELOSE. The possibility for the VOI to get economic profits from the forest resources that they are managing is particularly difficult.

B. SUB-OPTIMAL SYNERGIES BETWEEN CFM AND SECTOR POLICIES

63. The ineffectiveness of the CFM policy in promoting conservation and boosting the livelihoods of local communities can also be linked to the weak integration of CFM with sector policies, this in spite of substantial progress over time. The analysis conducted for this report reviewed key pieces of sector legislation including those on land tenure, agriculture, energy and mining, and decentralization, among others. Figure 5 and table 8 provide a summary. The review allowed to conclude that important progress has been made over the years. Yet, the lack of synergy with land tenure policies is particularly problematic. Synergies are existent, in the texts, notably with the agriculture and decentralization policies, but weak implementation means that more could be done in practice.

64. Progress to date. Since the publication of GELOSE, sector level reforms have recognized directly or indirectly the importance of natural resources management and of CFM in particular. In 2005, the Policy note on Decentralization and Deconcentration stressed the importance of turning decentralized authorities into key actors for the sustainable management of natural resources, in order to promote sustainable development. The policy also recognized the importance for Municipalities, Regions and Provinces to rely on the participation of local communities. The policy also gave a role of monitoring and control to the deconcentrated authorities (i.e. the technical services of the central ministries located in the various regions). In 2006, the National Policy for Regional Planning made explicit reference to the 2004 Poverty Reduction Strategy Paper and its objective of promoting community-based rational management of forest resources. This principle was also captured in the National Program for Rural Development (PNDR), in 2008.

65. Progress has also been made since the end of the political crisis in 2013. The process to revise the National Policy for Regional Planning is under way. The draft law²⁶ stresses the need to adequately classify the zones between forests, pastures and agricultural lands. It also invites different stakeholders, including the deconcentrated services of the administration, the private sector and the civil society, to actively participate in the committees being established for the elaboration of National, Regional and local Planning Schemes. Notably, the draft law mentions that agriculture should have enough space for crop rotation. The lack of enough “official” space is one of the reasons behind continuing slash and burn agricultural practices, which is in turn a cause of deforestation.

²⁶ Despite the promising potential for improving things, it is still a draft law that has not been adopted yet. So one should be cautious and not take it for granted.

66. Outstanding issues with land tenure policy. A key aspect of the CFM policy is the transfer of renewable natural resources management rights to VOIs within the limits of their ‘terroir’ and with respect to lands that are in the domain of the State or the decentralized authorities. While at the time of approval of GELOSE all idle lands were presumed property of the State, the land tenure reform of 2005, with the objective of promoting rural development, reversed the burden of the proof. With the reform, municipalities could recognize land tenure rights to private individuals that occupied the land under question. In addition, law 2008-014 established that lands within the private domain of the State and the decentralized authorities was subject to registration. The combination of these two well-intentioned reforms, together with the lack of registration of most forest land (Aubert, 2012), implies that it is not clear if land that is not already registered in the State’s or municipality’s private domain could make the object of CFM. As a consequence, the principle of land use right, and legal sustainable exploitation of forest resources, established in GELOSE, is virtually void.

67. Although sector policies recognize the role of CFM, practical implementation of the legal principles is absent from key sectors. According to the legislators, development policies, particularly in forestry and agriculture, should provide the basis for the promotion of economic alternatives that are of key importance for motivating local communities to implement CFM. In practice, the regional agriculture and livestock services are often unaware of the existence of CFM contracts (which are rarely mapped or registered by the administration). For this reason, technical rural development services do not actively support any particular development activities in CFM areas. This situation is regrettable; especially in areas where slash and burn agriculture is predominant. In fact the role and importance of fallow lands is often neglected²⁷. However, the transition areas between forests and agricultural land provide important social, ecological and economic services which are being quickly degraded. On the contrary, farmers are almost exclusively offered alternatives for agricultural intensification that involves “fixed” crops, along with a substantial reorganization of the traditional production systems, including livestock. It is likely that the control of fertility of fallow lands is an important step towards the search for solution to primary forests’ clearing, which would provide more incentives to encourage farmers to sustainably manage or conserve their forests²⁸.

²⁷ For foresters and conservationists, these lands are not considered forests because they do not have any ecological function (biological bridge for example), or because they are located in the core of protected forest. For the agriculture service, their contribution to the production is neglected because they are not agricultural land per se.

²⁸ Recognition of the importance of fallow lands can be found under article 6 of the draft law on regional planning, stating “The agriculture sector must have enough space for crops rotation”. A possible interpretation of this formulation is the recognition of fallow lands as locations to implement rotation of crops. However, those rotations have to be sustainable in order to deter the slash and burn practitioners in forests.

Figure 5: Links between CFM and the main sector policies

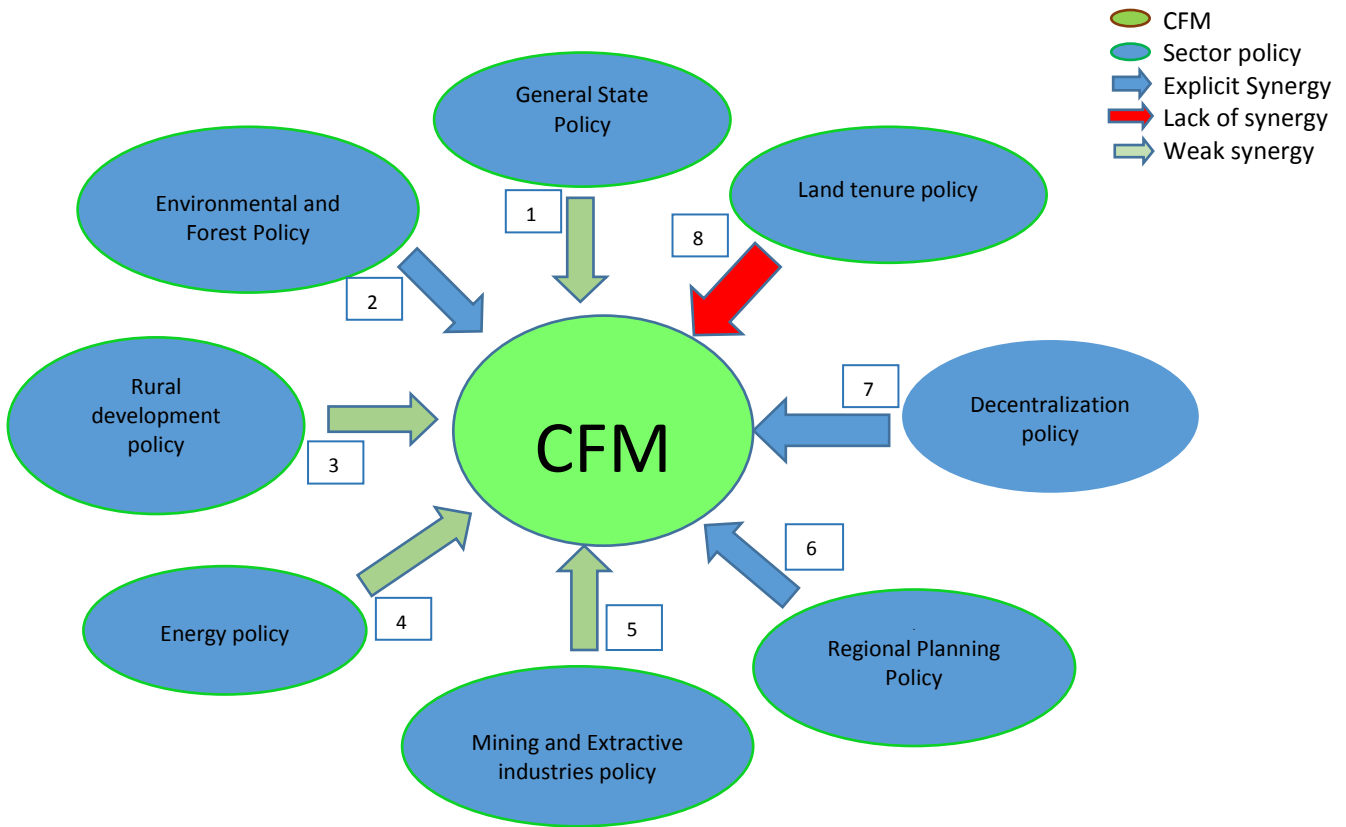


Table 8: Summary between the different public sector policies and CFM

N	Explicit synergies between texts	Weak synergy ²⁹	Absence of synergy	Risks related to the weak/absence of synergy
1	Importance of sustainable management of renewable natural resources and environmental governance at all levels	Consideration of the importance of the management of renewable natural resources and the environmental governance at all levels. Natural capital valorization and ecosystems protection, without explicit mention of CFM		Weak impacts of the General State Policy on CFM, leading to the continuation of the degradation of forest resources.
2	Explicit recognition of local communities integration, as well as their well-being in the management of renewable natural resources		Lack of tangible actions suggesting efforts towards consistency between activities.	
3		Valorization and preservation of renewable natural resources, including participation of the poor in environmental management. No explicit mention of CFM.	Lack of agricultural technical support on CFM sites	CFM does not benefit from the improved agricultural measures, or technical innovations, implying a strong likelihood of the continuation of the deforestation practices.
4		Rural electrification, biomass and renewable energy are part of the strategic axes. No explicit mention of CFM.		No direct consideration of CFM at the design and the implementation of the policy, suggesting weak impacts on the communities.
5		Effort towards consistencies "mining-environment": alternative livelihoods around Protected areas	Lack of tangible actions suggesting efforts towards	Frustration and demotivation of VOI members due to the weak socio-economic incentives from oil and mining activities, conducted on their territory.
6	Mention of sustainable management of renewable natural resources by local communities among the objectives of the National Plan for Territory Management (PNAT) 2006; as well as development of convened municipal management plans in the law project (in inception).		Lack of tangible actions suggesting efforts towards consistency between activities.	Conflicts between the Regional Planning Policy and the municipality development plan are not consistent with the CFM.
7	Acknowledgement of the necessity of involvement of local population in support of the CTD for managing the renewable natural resources.		Insufficient decentralization and disengagement of the State	Limited access to development opportunities, due to the low involvement of the decentralized territorial collectivities (the communes) in CFM
8			Forested lands not taken into account in the implementation of the land tenure reform of 2006	Conflicts related to the delineation and the use of forested land that are often not subject to land registration for title purpose.
Note: The detailed analysis of the synergies between CFM and the different sectors are in Appendix I.				

²⁹ Weak synergy indicates that elements suggesting synergy are present in the texts without explicitly referring to CFM.

68. Capacity constraints are also key in the application of the decentralization policies. The GELOSE law, along with the revision of the law on decentralization³⁰ (October 2014), establishes that Municipalities play a key role in planning for and monitoring the sustainable use of forest resources, as well as in protecting the VOI. In fact, the Municipality is theoretically capable of redistributing benefits from timber and non-timber forest products via the development of tax mechanisms. In other words, along with the forest administration, the Municipality could contribute to ensure the sustainability in the management of forest resources. However, due to the lack of financial, material and personnel means, the implementation of the actions often rely on the development of partnerships with different stakeholders (e.g. VOI, NGO, associations, donors, among others).

69. Farmers living in transition areas between the forest and the cropland are supported through alternative income generating activities which are often inefficient. As a compensation for the lost use of a conservation forest, conservation programs typically promote alternative income-generating activities (IGR) with the objective of modifying the habits of individuals that regularly rely on natural forests for their livelihoods. However, alternative income generating activities have often struggled to be adopted in the long run, particularly because these models are rarely sustainable (Rabelohataona 2011; Rakotomalala 2011; Brimont et al., 2015): (i) the appropriate technical skills are lacking, thus the practice generates much less benefits than it potentially could if proper techniques were used; (ii) access to markets is often limited; (iii) access to credit is also limited.

C. THE BASIC PRINCIPLES OF CFM ARE NOT RESPECTED BY THE VARIOUS STAKEHOLDERS

70. Several basic principles have been identified using international literature for CFM to work. Those principles include i) the empowerment of local actors in terms of responsibility, ii) strengthening of local organizations, and iii) a redefining of the role of the State: –

- *Empowerment of local actors in terms of responsibility.* Participatory CFM is pertinent only if it contributes to empowering local users of woodlands (Ostrom 1990, Borrini-Feyerabend, 1996, Ingles and al., 1999, Dubois and Lowore, 2000. Roe et al., 2009. Shackleton et al., 2010. Waglen et al., 2010). This can be effective under three conditions: i) Respect of the relevant stakeholders' will thus, of the voluntary nature of the initiatives: actions from voluntary actors should be given preference. Actors must be well informed of the benefits and limits of the proposed options. It is recommended not to seek for collective organization and/or any form of obligation unless it is proven that they guarantee the effectiveness of the actions carried out by volunteers. This situation should be rare. ii) The absence of administrative affiliation of initiatives in participatory approach within a community is also

³⁰ According to the law, the municipalities are provided the role of setting operations and actions related to the protection of natural resources, especially in terms of fire prevention and deforestation (art.24 of the 2014-018 law).

important, for reasons of principle and for psychological reasons: indeed, to feel responsible, members of a given community must feel free undertaking their actions (with the risks that this entails) and not having to permanently report to an external entity on which they depend. iii) Provision of free access to information and training on technical and organizational topics related to the management of resources for individuals that are interested. Local actors cannot, from one day to the other, become efficient managers; they must learn from experience, and this takes time and the appropriate training. Unfortunately, many participatory and community forestry cases (IIED, 2009) failed because they did not respect this fundamental principle of responsibility.

- *Strengthening of local organizations.* The importance of training and information of local actors emphasizes the need for the public authority to leave the leadership of the forest management to local actors. The public authority must be there to provide support, assist, and facilitate the development of the chosen types of local management by: (i) providing information on the technical options and organizational potential, which must be left open. This would provide information on what has been done elsewhere, even if they ended in failure. Technical systems and organization should never be presented as models, but as simple examples to follow or not, depending on local conditions and the expectations of stakeholders. (ii) by providing awareness to stakeholders on the legal conditions, and administrative formalities to satisfy for a good implementation of the activities, and thus, to ensure that local forest management contributes to sustainable development. The role of the public authority is to inform stakeholders on what can be done and what cannot, without substituting themselves to the actors themselves. (iii) finally by facilitating local communities' access to funding (grants, various aid) when activities involve the need for additional resources from outside of the local community. Some countries that opted for a policy of devolution of the responsibility for management of natural resources to local actors, have implemented local investment incentives, but the modalities for obtaining those are not always well understood/known by actors involved in participatory and community management of the resources.

The bottom line is that local actors should be supported by the public authority, and not put under administrative affiliation/supervision.

- *The redefinition of the role of the State.* This orientation towards support for local communities is relatively new in many countries, where the forest services of the State remain primarily responsible for monitoring the use of forested lands by the rural population. The participatory and community management implies a redefinition of roles, tasks and responsibilities of the forest administration. This can take various forms: (i) implementation of a specific service to support communities: consisting of extension workers assigned to specific regions, the support specialist systematically provides advice to communities. This type of organization is relevant only if the public authority deliberately embarks on a decentralization policy that led to the creation of many forests under a

participatory and/or community management regime. This type of organization is rare. (ii) Set-up of a special mailbox for the support to communities facing management problems (techniques and organization of harvesting of timber and non-timber products, choice of species to plant and techniques for planting. The systematic provision of forest agents to help communities in their respective sectors, as well as their systematic appointment in management boards remains for now the most widespread form of support. In the absence of adequate training from the foresters in question, it is however the worst case possible because it created long term dependence of communities on the forest administration.

D. STAKEHOLDER ANALYSIS: DIVERGING OBJECTIVES AND AN INEFFICIENT POWER/RELEVANCE MIX

Because of the lack of synergy between the texts, especially the non-respect of the normalization of the legal actions (production of laws, followed by the implementation decrees), there is no precise procedures for the transfer and the monitoring of the implementation of CFM. Therefore, stakeholders act, not on the basis of the texts and the procedures but rather based on their position vis-à-vis the other stakeholders. Indeed, experiences in CFM between 1997 and 2004 suggest the lack of a procedural basis since the beginning³¹. The transferred resources are slightly degraded because of predators from outside the VOI (RESOLVE-PCP-IRD, 2005).

The three conditions to ensure the effectiveness of the implementation of CFM (i.e. i) the respect of the relevant stakeholders will thus, of the voluntary nature of the initiatives; ii) the absence of administrative affiliation of initiatives; and iii) the provision of free access to information and training) depend, at the end of the day on the stakeholders' strategies, which needed to be analyzed.

71. A rapid stakeholder analysis has been conducted to identify key constraints and opportunities for CFM policy development in Madagascar. Stakeholder analysis is the process of identifying the agents or group of agents that are likely to affect or be affected by a proposed action or policy. The analysis aims at sorting them according to: (i) the impact (influence) they may exercise on the policy; and (ii) the impact the policy will have on them (importance or relevance). The analysis is then used to assess how the interests of those stakeholders should be addressed in the case of a change of policy, program, or other action, and what level of engagement is required for the policy change to succeed (Brugha, R., and Varvasovszky, Z., 2000). A key tool in stakeholder analysis is the influence/importance matrix, which graphically maps agents across these two dimensions. In this report influence is taken as the power different agents or group of agents have to affect the impact of CFM policy either through their participation in the planning process or in the implementation of the

³¹ Bruno Ramamonjisoa, Hervé Rakoto Ramiarantsoa et Thorkil Casse, « La Loi GELOSE et le transfert de gestion des Ressources Naturelles à Madagascar », Les cahiers d'Outre-mer, 257 | 2012, 5-10.

policy. Importance, or relevance, measures the fit or alignment between the overall CFM policy objectives and the individual stakeholders' objectives.

72. The following actors can be thought of being involved in CFM policy.

- The forest administration (representing the State) is in charge of policy development as mentioned in CFM contracts and it is involved in the monitoring and evaluation of CFM contracts. The State theoretically lies at the center of decision-making and plays a very important role in terms of regulation and supervision. However, low financial resources may imply a weak human and technical capacity that hampers the effective exercise of these functions.
- The Municipality is part of CFM contracts and could be the owner of the land being transferred to the local community. It is also in charge of preparing and implementing the local development plan with which CFM implementation should be consistent. It also plays an important role under CFM in protecting the VOI, in monitoring and evaluating the implementation of CFM at the local level, but also in redistributing benefits from the sustainable use of forest products. It also plays an important role in the management of conflicts. In practice, the role of the Municipality is often limited to the validation of files relating to the existence and the functioning of the VOI. In implementing its functions, it may be limited by the lack of financial, human and technical resources.
- The VOI is a legal entity formed by a group of members of the community that voluntarily constitute themselves as a civil society organization and are part of CFM contract. They are the entity to whom the forest management public service is delegated to by the owner of the resource. The VOI members, according to the law, should also be the primary beneficiaries of the economic benefits from the forest management transfer. They have very limited power to influence the process of CFM, especially at the design level. Generally, contributions are limited to simple consultations.
- The fokonolona may include individuals residing in a delimited territory (a village or a hamlet), possibly linked by similar ancestry, lineage or culture. Traditionally, *fokonolona* enjoy broad autonomy of management, including security and judicial aspects. Although the *fokonolona* is not directly involved in the decision making process regarding the resource, it may block decisions by various means because its interests are sometimes contradictory to those of VOI.
- The NGO or support organization is often primarily driven by forest conservation objectives and uses the CFM contract as a tool for engaging local communities in conservation activities in forest buffer zones. They are actively involved in the design of CFM contracts; they collaborate with the State in the design of projects and temporarily supervise CFM implementation. But their methods of intervention are not always transparent. They have a relatively good capacity to capture financial resources. They can exert strong lobbying at the State and donors level by obtaining funding. Their time-bound involvement (based on project duration) does not allow them to invest locally into the social dynamics for the long term.

- Law enforcement is applied by the army, the *gendarmerie*, and the police and include those parts of the administration in charge of making citizens respect the rule of law. They play an important role at supporting to the VOI during the implementation of CFM, especially with regard to non-VOI members. Despite the fact that many of the CFM *dina* are already homologated by the tribunal, because of the existence of a transaction instrument, by which an infraction can be dealt with administratively by the forest department, and because they are rarely mobilized for CFM issues, this group of stakeholders does not really influence the CFM planning and implementation process.
- Migrants are individuals who came to a certain territory mainly for economic reasons (e.g. for the exploitation of mines or forest conversion to agricultural lands) and that are not necessarily subject to local customary rules. They can be major players in terms of deforestation, degradation, or conservation. Although they have no influence on the CFM design and implementation process, depending on their main activities, they can foster, or become constraints for the VOI during the implementation of CFM, especially in the enforcement of the *dina*.
- Private sector operators can play an important role in the development of management plans for the sustainable extraction and commercialization of forest resources. Their financial support can influence the implementation of CFM. Taxes related to their activities can contribute to the effective redistribution of forest revenues by the Municipality or forest administration. They are not invited to participate in CFM decision-making process, but they can influence the VOI by providing access to markets and finance for the exploitation of forest resources.
- Customary authorities usually correspond to the ‘elders’ in the village, whom in pre-colonial times used to have authority over the village or *fokonolona*. Their involvement in CFM is far from being systematic and depends on the support organization and the willingness of the VOI to include them. But usually, they still play a very important role in the management of conflicts.
- Academia involves universities and research institutions. They can contribute to the training of actors and assist them in the decision-making process through better understanding of social or ecological dynamics, and disseminating knowledge, as well as best practices. But they are not systematically mobilized in the implementation process or impact assessment of CFM.
- Donors provide finance for development and conservation programs. Without their support, the implementation of CFM is hardly possible. Donors can be influential due to their policy dialogue role, which allows them to stimulate political decisions. They can establish conditionality that determine the obtaining of financing support. But it is often difficult for them to promote inter-sectoral approaches.

73. Figure 6 maps stakeholders in the matrix along the influence/importance axes. The fact that CFM has a dual objective of (i) promoting the conservation of renewable forest resources, while (ii) boosting the economic conditions of participating local communities, is represented in the figure by

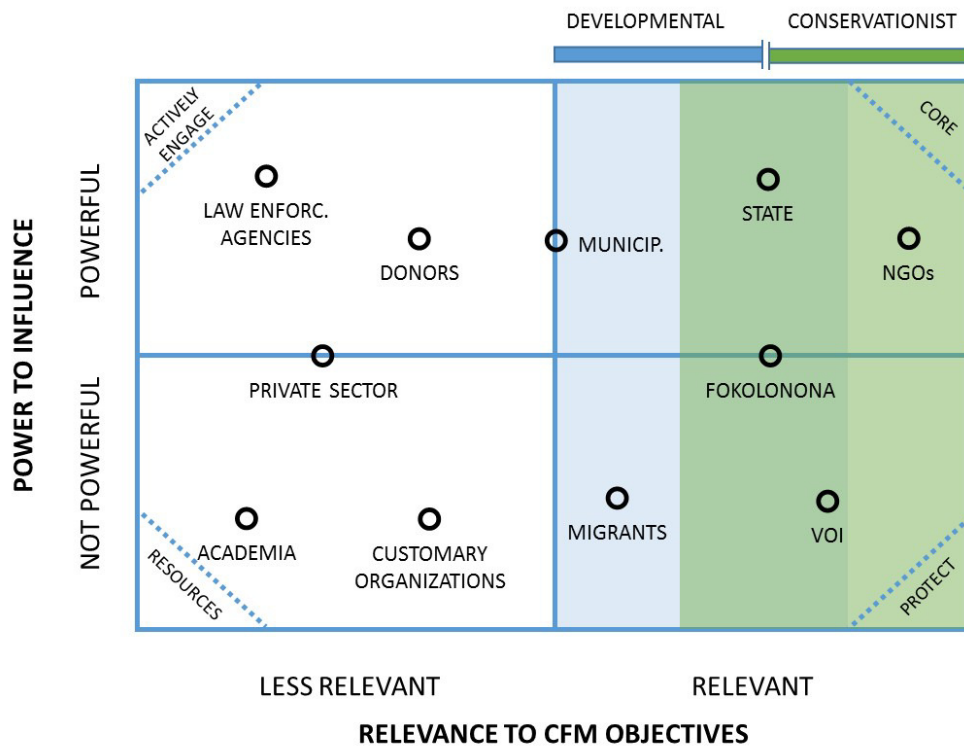
the developmental/conservationist shades in the right-hand side of the matrix (i.e. along the 'higher' relevance/importance to stakeholder objectives dimension).

74. Through the stakeholder analysis, we can identify 4 distinct groups of stakeholders:

- In the upper-right quadrant is the group of 'core' stakeholders, whose objectives are most aligned with the CFM policy objectives and that have power to influence the success of the policy. These include the forest administration, influential in planning and execution, the municipalities, influential in both (local) planning and implementation, and the NGOs who are often able to channel financial resources towards community development and conservation activities. In this group there is a potential tension between the conservation and development objectives of the policy, particularly when win-wins are difficult to obtain. It was noted above how the GELOSE principle of community development through (sustainable) natural resource extraction has been poorly implemented in practice and how the conservation motive might have played a role in such state of affairs.
- In the lower-right quadrant is the group of stakeholders that policy implementation should aim at 'protecting' as they are among the primary beneficiaries of the policy. This is a group of highly important stakeholders, yet not influential, including VOI and migrants. For CFM to be effective, this group will require special attention. However, their interests may be divergent: VOIs have a stake in terms of both income generation and conservation (the base for future income generation). VOI also seek to regulate access to the transferred forests, so they have a relative ability to influence the impact of the policy. Migrants who do not have land and need to settle somewhere for their subsistence, may enter in direct conflict with VOI and the conservation goals. Sitting at the frontier between the upper and the lower quadrant are the *fokonolona*. These may occasionally have the power to influence the outcome of the policy, particularly when the collective forces can drive change at the individual level.
- In the upper-left quadrant is the group of stakeholders to be actively engaged in CFM policy. Their objectives are less aligned with the policy but they may be highly influential stakeholders due to their ability to finance conservation/development efforts or promoting the rule of law. Although these two groups of stakeholders are not explicitly mentioned in any CFM-related texts, in practice, they are unavoidable actors. The two stakeholders in this group require careful monitoring because they may become source of opportunities. They may also be source of risks if instead of supporting the process, they distort it to advance different agendas or priorities. This has been the case for example in respect to the 2005 land tenure reform, highly supported by donors (for agricultural development) but that effectively resulted in creating a legal void for unregistered forest land transferred to local communities.
- In the lower-left quadrant are the 'resources' stakeholder. They have low relevance and low power to influence. Although they can contribute to the effectiveness of CFM by bringing new knowledge and financial resources to the table, or make sure the cultural rights are safeguarded in the process in the interest of long-term sustainability.

75. **The stakeholder analysis reveals a potentially inefficient power/relevance mix.** In particular, it is important to note that the three entities part of a typical CFM contract are not in the same group. The VOIs are mapped to the lower-right quadrant (high relevance, low influence), whereas the forest administration and the municipalities are mapped to the upper-right quadrant (high relevance, high influence). In addition, it is possible that the objectives of the more conservation oriented forest administration are not completely aligned with those of the Municipality, which represents not just communities living near the forest but all communities in the municipal territory (including those in agricultural areas and in urban areas). This delicate balance may be also affected by ‘external’ (with respect to the contract) agents such as NGOs, donors and the law enforcement authorities.

Figure 6: CFM stakeholder analysis matrix



The current position of the VOI does not suggest a trend toward an efficient implementation of CFM because despite their high relevance, they have limited influence over the process, including the decision-making. For CFM to work, there would be a need for :

- Increasing the influence of the three main stakeholders of CFM, especially that of the VOI.
- Decreasing the influence of the i) migrants, by reinforcing the simultaneous implementation of forest patrolling and the efficiency of the *dina* (via the improvement of existing customary

social conventions - already accepted by both the local population and the migrants - and not the creation of new ones) ; and ii) the NGOs by limiting their actions, which mandate should be well defined in the CFM process (because currently, NGOs are the trigger of the process, they provide financial and technical support, they are the bridge between the administration and the VOI, and/or between the VOI and the market, and they decide when to end the support to a given CFM.

However, these two points cannot be achieved without the formulation of a clear and precise procedure about CFM to follow for its implementation and monitoring.

E. WEAK LAW ENFORCEMENT: A CHALLENGE AT LOCAL AND NATIONAL LEVELS

76. Enforcing community-based forest contracts has proved challenging at two distinct levels. At the local level, community-led enforcement may be ineffective when dealing with agents that are external to the VOI or to the community altogether. At the regional and national levels, the lack of information, the problems of weak rule of law, corruption in the administration and the judiciary bodies, and poorly equipped law enforcement agencies are more common. These issues are described below.

77. Traditionally, behavior and resources use in rural communities have been governed by sets of local rules or social norms called *dina*. These rules are meant to be the result of experiences and the history of a community. They are developed and enforced by the communities themselves. Rakotoson and Tanner (2006) estimated that more than 75 percent of the Malagasy population that still lives in rural areas, is governed by the *dina*. Failure to comply with these obligations is punishable by *vonodina* (penalties).

78. The GELOSE foresees the *dina* as a key tool for its implementation. Under the law, the *dina* is used to govern VOI members and to regulate their rights to use natural resources. Nevertheless, it is important to denote that the expression "*dina*" refers to various types of local regulations. The adoption of *dina*-like instruments by the law has meant that *dina* can be categorized in three basic types, depending on whether they are used to regulate the use of State (or local Government) owned resources vs. community owned resources; and depending on whether *dina* are developed by the community itself. Type 1 *dina* are meant to regulate access to community-owned resources and are developed by the community. They are typically oral. Because they apply to traditional land owned by the community. They fall under custom and aren't concerned by the control of legality. The key rationale for the *dina* is to regulate the use and allocation of land. Forest is typically considered a land reserve, eventually convertible to agricultural land through slash and burn. This is the most traditional

type of *dina* and is still found in the most remote rural communities. Type 2³² *dina* is usually written and it is applied to a resource whose right of use has been transferred by an official owner (e.g. the State) to the local community. It will take effect only after approval by the local mayor and may be subject to a judicial review at the request of the State representative. This type of *dina* is meant to be used to manage a resource within certain limits of use. Its preparation is the prerogative of the community. Finally, type 3 *dina* are created and driven by local authorities with the participation of the *fokonolona* and require a legal review. They must be homologated by the Ministry of Justice to ensure compatibility to the State laws and the Constitution. This is the least genuine typology of *dina*.

79. *Dina* governing CFM falls into the second category. In this context, the *dina* have become local normative provisions which set out obligations “to do” or “not to do” to members of the community who recognize them (art. 15 of the 2000-027 decree). They “may not include measures which may harm the general public interest and public decrees. Its requirements must comply with the constitutional, legislative and regulatory provisions in place, as well as the recognized and uncontested uses in the municipality of affiliation” (art. 50 of the 96-025 law). Failure to comply with *dina* is punishable by *vonodina* (penalties).

80. It is therefore the responsibility of the VOI to approve a given *dina* according to the customary rules governing the Community (art. 49 of the GELOSE), and it is responsibility of the Mayor to validate the community-agreed *dina* to make it enforceable. If the Municipality considers that a given *dina* was stained with illegality, it can file a complaint to the Administrative Court (art. 51 of the GELOSE). In order to better anchor the *dina* in the national legal framework and to empower the actors involved in its application (communities, elected traditional authorities), it is common to proceed to the homologation of the *dina* by the Court. This strengthens the legality of the *dina*, and facilitates appeals to justice in case of necessity. However, an appeal to the court should only incur upon exhaustion of all the procedures established by the *dina* (article 52 of the GELOSE).

81. In practice, the *dina* effectiveness has faced the following challenges:

- Uncertain application. Even in the event of homologation of the *dina* by the Court, the judge will not necessarily sanction a refusal to comply by members of the community. Relations of influence still play an essential role, often at the detriment of respect for the *dina*.
- Lack of legitimacy. As indicated in the GCF decree, NGOs supporting the implementation of CFM usually offer standard *dina*. This type of *dina* does not necessarily reflect the real, natural needs from the communities (ESSA 2008; Bérard 2011). Moreover, externally driven *dina*

³² The art. 49 to 53 of the GELOSE law refer to the *dina* of VOI and the art. 15, 18 and 19 of the 2000-027 decree.

often lack the flexibility of the traditional rules, thus are incapable to take into account the economic status of the rule breaker.

- Weak ownership by the community. One strength of *dina* lies in its legitimacy within the community. It is because they emerge through local institutions identified as the seat of community power that they are respected and enforced. In the case of CFM, the *dina* is often times developed by the VOI, a sub-group of the *fokonolona*, legally recognized by the State as an entity that is part of the CFM contract. But the VOI can represent as little as 10 percent of the *fokonolona* in some cases, which considerably limits its effectiveness.
- Limited range of application. The *dina* cannot be enforced to control and/or punish people outside the community. So it is not a full substitute to the forest control carried out by law enforcement entities. The latter are in fact the only ones habilitated to verbalize infractions.
- Tension with social cohesion. *Fihavanana*, the notion of solidarity and cohesion between members of a community, is an important value. It is a powerful force in communities and creates unity. However, *fihavanana* also creates problems in the application of *dina*. Even though each member is supposed to be responsible for the enforcement process, 'betrayal' of a close friend or a relative and having him/her pay fines, even when they infringe the convened rules, is seen as a threat to this rule of social cohesion. The village leaders are hesitant in this context to apply the *vonodina* fearing that it will cause further disputes and hurt relations within members of the community.
- Capture. The strength of a *dina* can also be its weakness. When a group dominates other groups the application of *dina* can become a tool of power. In many cases, the village authorities have total control over the VOI. Some authorities manage to exert pressure on the management committees of the VOI so that the implementation of *dina* becomes selective. Many people therefore remain in impunity, discouraging the population and causing feelings of anger and frustration.

82. Law enforcement by Government authorities becomes essential when the *dina* fails, particularly in terms of applicability. This is especially the case when a territory with a CFM contract is targeted by mass migration from other regions. According to Karsenty (2011), mass migration into forests occurs when lucrative activities (such as precious stone mining) are identified. This happens at times with the complicity of local authorities. Under such circumstances, the local structures are powerless and the support of armed forces becomes the only possible measure to deal with the situation. Owing to lack of resources, Government response is often delayed or absent. Non-mastery of the illegal exploitation by migrants can have substantial consequences for community management, because it highlights the weakness and lack of effectiveness of the *dina* as a regulatory

tool. It also causes a loss of confidence towards the leaders and members of the management structure of the VOI, because they are powerless and are unable to resolve the case. In such cases, the VOI may eventually get dissolved and free access to forest resources becomes widespread (Ramamonjisoa et al. 2012).

83. Even when migration is not an issue, the need for social cohesion can be a constraint to Government law enforcement. Even if the failure to condemn exposes the community to sanctions for transgressions (articles 48 and 49 of decree 60-128), *fihavanana* prevents the members of the community to condemn their neighbors. This mechanism has been abused by illegal loggers during the political transition period, and in the aftermath of natural disasters³³.

84. Lack of resources can be a constraint to the application of law enforcement by the Government. At the municipality and *fokontany* level³⁴, officials, thanks to an established *dina*, subsequent to the 2001-004 law on public security, can proceed to the enforcement of certain punishments against law infractions within their territory. A *vonodina* can be applied as a penalty for the offender³⁵ but in that case, the penalties are not equivalent as those pronounced by the courts. The enforcement of forest laws principally is incumbent upon the forest administration which plays a major role in pursuing the offenders. For this to happen, however, the infraction must have been verbalized by agents of the forest administration, the only ones allowed to proceed to identify and verbalize infractions and the ones in charge of bringing the case to justice. However, forest law enforcement is often understaffed or underequipped, and areas to monitor are often very vast. Moreover, most infractions at the local level are rarely punished because they are never reported to authorities.

85. Confidentiality of transactions is also an important aspect of weak forest law enforcement. Even if a forest transgression is reported, there is always a risk that the normal sanction is not enforced. Indeed, decree 60-128 allows for a 'transaction' to be concluded between the offender and the forest administration. This transaction may occur either before or after judgment (art. 41). The transaction consists in the offender admitting the infraction and paying a certain amount of money to the forest administration in exchange of the abandonment of the prosecution (art. 20). However, these transactions which are the preferred solution for dispute resolution, can easily be a source of

³³ When a natural disaster occurs, and if the impact on rural livelihoods is particularly affected, logging becomes socially accepted as a mean to compensate for lost income.

³⁴ *Fokontany* refers to the smallest administrative unit in Madagascar.

³⁵ The penalties, however cannot replace the monetary reparations to be considered for the benefit of the VOI (if the offender is a member of a VOI), or, if applicable, the criminal prosecution by the administration. Moreover, despite certain practices, the *vonodina* cannot request any "fine greater than stipulated in articles 472/6, 472/7 and 472/8 of the penal code on the *fokonolona* conventions" from the offender.

corruption at the local level and are rarely reported at central level or at the level of the public treasury. A first step recommended would be to require the results of the transactions to be systematically public; this is expected to be more efficient than prohibiting transactions, which would easily just make transactions illegal without actually reducing the number of infractions.

In specific cases, when forest service catch infractions, the preferred method to promoting rule of law is for the forest service to educate the people caught in violation of forest legislation and avoid the application of sanction unless the offenders repeat the infraction. However, the lack of effective punishment of crimes may lead to the fast and uncontrolled degradation of forest resources. This discourages members of the *fokonolona* at large in participating in CFM.



IV. POLICY RECOMMENDATIONS

86. Poverty and environmental degradation can interact in complex ways and in ways that are often detrimental to both human livelihoods and the environment. With communities relying on natural resources, the journey from poverty to prosperity is likely to be a gradual one, especially among households with low levels of education and few employment opportunities. Forests may provide a gradual stepping stone that help to move the chronically poor to the moderately poor, and the sometimes poor to the non-poor. CFM is one potential tool for this to happen; indeed, it is a mean to build local people's capacity and thus promoting civil society's involvement in establishing democracy and the rule of law.

87. A number of successful examples of CBNRM around the world point at the fact that conservation through communities' efforts is possible. Measham and Lumbasi (2013) stress the importance for the local community to initiate the process. In Australia, a group of concerned *Gippsland* residents, mostly farmers plus some retired forestry professionals living in rural towns, came together under the title of the *Gippsland* Plains Tree Health Group in 2004, due to long-held concerns about remnant vegetation management and revegetation. The initiative was instigated by local residents, seeking ways to better understand dieback, how to improve ecosystem health and in addition, how to engage neighboring landholders in addressing the issues. In Kenya, the *Ishaqbini Hirola* Community Conservancy was formed for the protection and management of the *hirola* antelope (an umbrella species) in the northeastern part of the country. The local community in the Ijara district in North Eastern Kenya established the conservancy in 2007 with expert advice from the Kenya Wildlife Service and the Northern Rangeland Trust. It has been the local Somali clans' desire that their natural heritage (*hirola*) is protected. Today, the local communities have set up their own rules vital for survival of *hirola* in the conservancy. Grazing rules have been formulated and are adhered to by all. Livestock is not allowed within the conservancy and there is prescribed punishment for any offenders.

88. Encouraging examples of community conservation in Madagascar point at the fact that success is indeed possible. *Anja Miray* Association was established in 1999 in response to the degradation and clearing of local forests, the sedimentation of water resources, and the loss of wildlife such as ring-tailed lemurs, chameleons and tropical birds. The Association operates a 30-hectare community forest reserve in the *Haute Matsiatra* region of Madagascar. The community has established an ecotourism initiative which funds community works projects – schools, health clinics and environmental education – and ongoing conservation activities. Ecotourism has also provided a revenue stream for alternative livelihood projects such as fish farming and tree nurseries. The Association has provided a leading model of community-based forest management in the country. In 2012, *Anja Miray* Association was awarded the Equator Prize.

89. The analysis of the previous pages has allowed to identify some key constraints in the application of CFM and CBNRM in Madagascar. These help explain why the *Anja Miray* Association example is not the norm, and what could be done to obtain progress at the national level. In this section, we capitalize on the review and sketch a number of public policy recommendations in the short, medium and long-term. These proposals should constitute an essential public policy complement to the widespread efforts already deployed by individuals, communities and associations throughout the country.

A. SHORT-TERM RECOMMENDATIONS (WITHIN THE NEXT YEAR)

90. Seek consistency between the GELOSE, the forest law and the land tenure law. It is necessary that legal texts on forest land tenure are developed in accordance to the provisions of the forest and environment policies. This will ensure streamlining of the sustainable use of domanial forests, and to facilitate the implementation of both the new protected area code (COAP) 2015 and the environment charter, revised the same year. This also applies to forestland reserves allocated for private reforestation purposes or for “local community use”, as suggested in the new land policy (final version in progress, 2015). In addition, art.2 of the GELOSE law could be revised to allow local communities to have land tenure securing of the resources they are managing regardless of the land status, as long as the purpose is related to sustainable forest management and development; the idea of using Local Land Rights Mapping (PLOF) also for protected areas management could serve this purpose. Furthermore, to strengthen the consistency even more, Municipal land offices staff should be provided training in natural resources management / CFM matters, and the delimitation of community forests should also involve the Local Land Rights Recognition Committees.

91. This amendment to the GELOSE law would have two benefits. On the one hand, it would imply that community managed land would be automatically under the forest land status³⁶, and on the other hand, it would make CFM a tool for securing stakeholders vis-à-vis their respective rights on the resources on the basis of an explicitly shared and formalized management objective (reforestation, rights to use and to harvest, ...). Thus, specific land tenure under CFM should be based on a revision of the relative land tenure security decree (n° 98-610), harmonized with the spirit of the ongoing land reform, and proposing options for securing land (Montagne et al., 2009). In all cases, improved cooperation between the forest administration and the other services of the State (e.g. land and territory development) and the decentralized authorities (Municipalities, or even Regions) is

³⁶ In fact, the specific land status are not limited to forests; the law is expected to acknowledge the importance of sustainable management of renewable natural resources; including protected areas, wetlands, pasturelands, lake, etc.

necessary, as well as the production of texts, mentioned in article 38 of the 2005-19 law on Land status in Madagascar.

92. Fill the gaps in the CFM legal and regulatory framework and correct the inconsistencies between the different forest, commercial and environment related texts. We have seen in the previous sections that regulatory gaps in the implementation of the GELOSE have led to multiple interpretations and applications of the principles of the law, and later on, to the development of texts that are inconsistent with GELOSE, which contributed to the ineffectiveness of CFM. One of the top priorities related to filling the gaps in the implementation texts of the GELOSE law is about the 4th section of the law, about the economic benefits that the VOI would obtain from ensuring a good stewardship in managing the resources in a sustainable way under CFM. Therefore, it is a key necessity, in the short to mid-term, to take action and to fill those gaps and inconsistencies in application of article 54 of the GELOSE law.

93. Develop national sources of finance to support CFM policy implementation on the ground. Today, CFM arrangements either lack sufficient finance to work (often resulting in forest degradation) or receive financing from donors or NGOs, and are then financially unsustainable. To overcome this issue, the use of the Local Development Fund (FDL) could be better linked to environment/forest dimensions. The obligation for Municipalities to develop municipal management plans is in this sense an opportunity to link sustainable forest management to Municipal finance. Obviously, such a commitment of the municipality will not be realistic unless there is involvement of the municipal advisory committee in the whole CFM process. In addition, the commercial use of natural resources in CFM should be well monitored and used to the profit of VOIs and local communities. This way, CFM and its beneficiaries could be strengthened. Furthermore, as the long term success of conservation interventions depends not only on communities along forest edges but also on different stakeholders at larger scales (Kremen 2000, Chan et al. 2007), policy should be developed to make sure that benefits reach all key stakeholders.

B. MID-TEM RECOMMENDATIONS (BETWEEN 1 AND 5 YEARS)

94. Strengthen the capacity of the State, both central Government and regional services, to plan and implement CFM policy. The stakeholder analysis we conducted highlighted both the forest administration's central role in CFM policy and its lack of financial resources. It is necessary to boost the forest administration's capacity to fully play its role, including making all stakeholders (Municipality, VOIs, private sector, NGOs) accountable for their share of the implementation work. Only the forest administration, among the key CFM stakeholders, can ensure an effective CFM policy implementation. Priorities should be given to: (i) the development of a training program that will involve the forest administration personnel; (ii) the collection of data for building a complete, national

database of all national forest resources; (iii) the development of a timely, robust and negotiated strategy to provision funds to the national forest fund (FFN) at the national and regional level, thus enabling access to sustainable financial resources for the forest administration; (iv) the update of the national forest zoning, allocating categories of forests according to their ecological vocations; (v) the development of a national forest monitoring system that is crucial for any forest-related initiative that the country undertake in the future, including REDD, or any PSE mechanism; (vi) the capitalization on the lessons learned from pilot projects implementation involving different sectors of activity, and the integration of such lessons in the development and implementation of appropriate legal and regulatory provisions.

95. Investing on building the capacity of the VOI through trainings and supporting the VOI network. One of the encouraging results from CFM implementation in Madagascar is the slow but tangible empowerment of the VOI, mainly through the training opportunities in various topics that are provided to them either by NGOs or by the decentralized technical services. One particular attention should be put on the networking of the VOI because peer-to-peer learning has a higher potential to be effective than expert-farmer type of learning.

96. Address the financial constraints that VOIs, Municipalities and the State face through performance-based payment schemes. Regulations could develop the use of payment for ecosystem services (PES) schemes with a clear emphasis on the benefit sharing mechanisms that should characterize such schemes. PES must respect the principle of economic additionality, but also that of the legal additionality: PES cannot lead "to pay for law enforcement", nor to question the rights of third parties involved in the land or the resources and exclude them from payment (Brimont et al. 2015; Karsenty et al., 2015). Finally, the benefit sharing linked to PES cannot be calculated on the sole basis of opportunity costs, particularly low in remote forested areas in a developing country like Madagascar. On the contrary, it should be based on the investment necessary to initiate households behavior change (Rakotondrabe et al., 2014). In all cases, the understanding of local dynamics (ecological, sociological, economic and institutional) should be well understood before bringing innovations for likely better targeted and more perennial development strategies (Rakotondrabe et al., 2014). Indeed, CFM is a system of governance in which a coordinated set of tools must be put in relation to the objectives of conservation and sustainable management of forests (natural and planted), while improving the living conditions of populations. None of these tools alone is a solution.

97. An example of PES is the REDD+ mechanism. The country is currently developing its national REDD+ strategy. In this context, the country will define the national principles for benefit-sharing of REDD+ revenues. REDD+ can have the potential to provide direct payments to the VOI or the whole community and could, in the mid- to long-term, compensate for the lack of financial means that the VOI, the Municipality, and the forest administration are currently facing. In fact, Madagascar counts a

number of projects, such as that of the *Corridor Ankeniheny-Zahamena (CAZ) and Makira*, which have already delivered results and sold carbon credits to the market. This suggests that the forest carbon mechanism can work although the amounts involved are for the moment still quite modest. More importantly, both the CAZ and *Makira* projects have put in place community benefit sharing schemes.

98. Awareness of the local rural population and the municipalities about the responsibilities related to CFM. The two above paragraphs assume that the municipalities and the local population are aware of all information surrounding CFM (the constraints and the eventual benefits, etc.), which is not necessarily the case; back in the late 1990's, under the Environmental Program II, a national awareness campaign about GELOSE was planned but was never undertaken because the priority under EPII was about establishing the pillars of the environmental institutions in the country, as well as strengthening them. However, the context has changed, those institutions are well functioning (although are not self-sustaining yet); and perhaps, now would be the time to undertake the national awareness campaign to have both the rural population and the municipal authorities to make informed decisions about CFM; which would be the key to deliver results under performance-based payment mechanisms. Indeed, full awareness about a given subject would provide more initiative to rural population to enter, in a completely independent way, a social dynamic and suggest actions that would help them get out of poverty, including (but not limited to) entering performance-based payment mechanisms.

C. LONG-TERM RECOMMENDATIONS (BEYOND 5 YEARS)

99. Move towards a decentralized, self-sustained forest monitoring, involving the coordination of actions of different stakeholders. It would not be possible to extend the implementation of the GELOSE law to CFM with harvesting and economic sustainable valuation of the resources without a strong consistency between the law and the texts on forest monitoring. To date, few support organizations (development or conservation) seem to give high importance to the necessity for a continuous monitoring of CFM contracts (GELOSE or GCF). However, some significant examples, with encouraging results exist in Boeny and Didy: these examples are the proof of the feasibility and possibility of a sustainable, functioning decentralized, self-sustained forest monitoring system, involving the coordination, at different levels of the different stakeholders that signed the CFM contract:

- The forest administration maintains its regalian power and focuses its interventions at its "*cantonnements*" jurisdictions, as well as its regional branches.

- The local community, via its VOI and their own forest patrollers (*polisin'ala*), ensuring the continuous monitoring of the resources that fall within its territory, and more specifically within the boundary, subject of the management transfer.
- At the municipality or inter-municipality level, a municipal (or inter-municipal) forest monitoring verifies and ensures that no illegal exploitation is taking place beyond the CFM transferred areas.

However, efficient monitoring has costs, which should be covered: in part by i) the income that VOI earn from the economic activities that they undertake from the forest, under CFM; ii) the taxes collected by the municipality for forest products harvesting taking place within its jurisdiction; iii) the taxes collected by the forest administration, based on the categories of the harvested resources (with important update to consider); and iv) either the public treasury or the national forestry fund (FFN).

The experience from Didy and Boeny showed that there is strong consistency between the implementation of section 4 of the GELOSE law, the increasing number of CFM contracts with economic valuation of the resources, and decentralized forest monitoring.

But realistically, upscaling these experiences at the national scale still requires several prerequisites, including i) at the VOI level : the VOI has to already have enough source of income (from economic incentives) for them to be able to cover the costs of the forest patrolling in a sustainable way ; ii) at the municipal level : the taxes (*ristournes*) from the harvesting of forest resources are actually collected and are allocated to activities such as control of forest products (i.e. The municipality has to already have included in its development plan the management of forest resources); and lastly, iii) at the national level, the national forestry funds (FFN) has to already be sufficient enough to allow the forest administration to undertake their role of forest patrolling, in coordination with other stakeholders.

100. Strengthen the capacity for law enforcement. A key element of functioning forest management contracts, whether with private operators or with local communities, is the capacity to clearly apply the law and respond to non-compliance. Building capacity of the judiciary, the administration and civil society is necessary to improve effectiveness of the legislative framework. In addition, environmental justice and information need to be taken to the people. Procedures need to be less complex and in line with the capacity of local communities to become meaningfully involved in environmental action and mechanisms such as traveling to courts and/or reopening of local courts. Another key element for this is the development of information tools capable of detecting pressure on natural resources at an early stage so as to be able to address the causes early on.

101. Promote traceability of forest products. We discussed the difficulty for the VOI to enforce rules towards members of their own community, migrants or the *fokonolona*; this is a major issue for CFM in Madagascar. Suspending or prohibiting the commercial use of forest products would not solve the issue; on the contrary, the suspension and prohibition measures tend to demotivate the VOI from investing their effort into sustainable management of the resources. The possibility to commercially but sustainably use forest resources cannot be effective without adequate investment in forest products (timber and non-timber) traceability. Without this investment, which exists under the law but is rarely implemented, VOIs will see pressures increase on the forests they manage (e.g. out of jealousy, lack of control capacity, and lack of support sanctions enforcement). In some cases, private sector operators may take advantage of the situation by using the name of the VOI, formally allowed to commercially use forest products, at the law enforcement checkpoints to justify the origin of products that are in fact obtained through illegal logging in surrounding forests.

102. Promote systematic collection of data related to the implementation of CFM contracts and their restitution to CFM stakeholders. Achieving this objective implies that all stakeholders involved in CFM contracts are responsible, including donors. In fact, a system for monitoring the impacts of CFM has already been developed under the COGESFOR project; the tool was transferred to the Forest Administration, which planned to upscale it nationwide with the help of conservation and development stakeholders (Aubert et al. 2011, Rahajason et al. 2014). **This type of information system still has a lot of room for improvement; however, once optimized, the system will allow different research and training organizations to have comprehensive and reliable data that will help better assess the impacts of CFM in Madagascar and help stakeholders in better implementing adaptive management of renewable natural resources in the future, both in terms of reducing deforestation, and in improving people's well-being.**



V. CONCLUSION

103. This report is not questioning the fact that CFM can be an effective tool to achieve conservation and to improve local communities' livelihood; nor does it minimize the achievements recorded with CFM implementation in the country; rather it focused on identifying the main pitfalls that should be avoided when designing/implementing CFM; in order to improve its effectiveness in the future. From experiences across the world, CFM proved to be an effective tool for achieving both conservation and improvement of people's livelihoods. In Madagascar, the substantial number of CFM contracts in itself suggests the interest of local people to participate actively in the conservation of renewable natural resources. Also, local populations' sense of ownership of the resources management process, and their capacities improved in many respects (organizational skills, democratic decision-making process, planning, collaboration with various stakeholders, etc.). Along with those lines, the analysis suggests that CFM may have improved households well-being for those who live closer to the forests, pointing at the heterogeneity of CFM impacts. However, overall, in over 15 years of implementation, CFM may not have achieved palpable results, neither for conservation nor for local communities' well-being. The legal and stakeholder analyses allowed to shed light on some of the main underlying drivers of the ineffectiveness of CFM. Those drivers include the lack of texts for implementing the GELOSE law, the internal inconsistencies between texts within the forest and environmental sector, the lack of synergy between the main public sector policies and CFM policy, the divergent agendas of the different stakeholders involved in CFM, and the lack of law enforcement both at the local community level, and at the higher level.

104. Some key recommendations are suggested. For the short-term, these include the need to strengthen the consistency between forest and land tenure laws, and within the body of forest and environmental texts, and the identification of national financing channels to support CFM policy implementation. In the medium-term, it is suggested to strengthen the capacity of the forest administration to plan and implement CFM policy, given its pivotal role, to promote performance-based payment at the national and international level. In the long-term, it is necessary to strengthen the capacity of the judiciary, the armed forces and the forest administration in law enforcement, and to promote the development of traceability chains for forest products.

105. This work is not exhaustive, due to time and resources limitations, and a number of actions could be taken to conduct further analysis in this important area:

- Consistent data on CFM institutions, design and practices, should be collected across CFM projects and shared between stakeholders, so that more in-depth impact evaluations could be carried out.

- Socio-economic surveys specifically designed for welfare impact evaluation should be undertaken to produce results that are more sensitive to local circumstances and to permit more detailed analyses of impacts on different groups of individuals within CFM communities (VOI members vs. non-VOI members, elites vs. non-elites, households nearer main village center vs. households far from main village center, male headed households vs. female headed households...).
- The relative merits of moving from a VOI-based approach to a village or *fokonolona*-based approach to CFM should be carefully analyzed. VOIs are facing difficulties related to conflict of interests, corruption or lack of legitimacy. There is some support in the public opinion for transferring the management structure from the VOI to an entity responding more to a territorial logic than to an associative process³⁷. In the first case, the residence of the individuals on a community territory would be decisive, establishing a de facto membership. In the second case, the will and the interest of individuals would be decisive for the community. Before supporting a substantive change in legislation, more in-depth research should be conducted.
- A more in-depth stakeholder analysis could be undertaken, using survey techniques, to better understand the motivations, the dynamics, and the power relations between the different stakeholders in different contexts.
- The present work only focused on two of the pillars of the policy: the legal and institutional framework. More in-depth analyses could be conducted in the future to explore other dimensions of the non-effectiveness of the implementation of the policy (e.g. lack of access to market, etc.).

³⁷ The association Tafomihaavo supports a legal move to restore the moral personality of the *fokonolona*, which would allow all individuals, resident in a given locality (or affiliated individuals non-resident, depending on the definition), to be automatically involved in the CFM contract if the *fokonolona*, empowered, signs the contract.

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A1. GENERAL LEGAL FRAMEWORK GOVERNING VOI

VOI "consists of any group of voluntary individuals, united by the same interests and complying with convened rules for the group. It may include the inhabitants of a hamlet, a village or group of villages." (art. 3 of the 96-025 law).

According to the 2000-027 decree, the VOI is an association of people gathered around a common purpose: "the local management of renewable natural resources according to the 96-025 law" and must be attached to a "municipality³⁸" (art. 1 and 4).

Any person residing within the limits of the boundaries of the VOI territory may submit an application to the General Assembly become a member. By this act, the person commits to comply with the rules of operations and run the activities and objectives of the VOI (art. 5). However, except for financial management, the 2000-027 decree does not mention anything in particular on decision-making process within the VOI, it is internal to the organization. However, in practice, relations of influence within local communities make it often illusory to respect a transparent, democratic process. On the one hand, it is not sure that the customary structures, forming the basis of social cohesion, are based on processes of non-exclusion. Finally, even in the event of mass inclusion of local populations, notables often find ways to take control of the management structures in the event of substantial interests; particularly in the process of valorization of forest resources. Also, in many cases, the management structures are not representative of the *fokonolona* or lack legitimacy. The result is a weakening of the VOI who are isolated or not considered by the rest of the population.

Note, however, that, in the event of conflict within the VOI, the law provides pacification, or arbitration, by the President of the Municipal Council before any (eventual) appeal to the court. Similarly, in the event of a conflict with the administration, hierarchical recourse must prevail before the court remedy. A provision allows even explicitly that the parties can submit their dispute to arbitration for an instance composed of two arbitrators appointed respectively by the parties and a third party-appointed arbitrator by mutual agreement by the two arbitrators or agreement by the president of the Court in the jurisdiction of which are contentious resources." (art. 46 of the 96-025).

According to articles 7 and 8 of decree 2000-027, the structure of grassroots communities includes:

- A legislative body: the General Assembly
- An executive body the Management committee
- Operational and financial management rules (Statute, Operations procedures and rules, *dina*)

The management committee members are not remunerated: due to the lack of means³⁹, monetary compensations are not necessarily considered in proportion to the work provided. But it is also the case for foresters, those of the municipality or of the *fokontany*⁴⁰.

³⁸ The VOI legal paperwork is submitted to the mayor. The municipality understands the objectives of the association, its location, its functions. In annex are also the list of the members and that of the elected representatives. The internal rules and/or *dina* must be developed and approved by the VOI according to a template appended to the 2000-027 decree.

³⁹ VOI income mainly come from :

- Membership fees,
- Financial and/or material support from supporting organizations,

To benefit from CFM, the VOI's existence must also be approved by the competent authority, namely, the authority usually in charge considered resources, i.e. the Regional forest administration (art. 3 of Act 96-025) (see below for the legal details of the issuance of this approval). Once approved, the VOI can theoretically ask the payment of damages and interest to the administration in the event of unilateral termination of the contract that prevents it to tap benefits from the assets it is managing.

The GELOSE law imposes therefore two essential preconditions on VOI for the recognition: (1) its declaration to the affiliated municipality and (2) its approval by the forest administration. These two administrative actions are inseparable elements of a reciprocal commitment of the three parties to the contract. However, in practice, these approaches, not institutionalized, are far from being systematic.

A2. THE LEGAL PROCEDURE FOR THE ACCREDITATION OF LOCAL COMMUNITIES

According to the GELOSE law, "The agreement is the official document giving the beneficiary basic local community [VOI], for the period specified in the act, the autonomous management of the mentioned resources, subject to compliance with stipulations and clauses of the management contract and the specifications previously negotiated and concluded between the parties.»(Art. 4). We note that the use of environmental mediation is mandatory for the first request of approval submitted by a municipality or when the resources subject to a management transfer should be managed by several municipalities (art. 18 and 19)". To be approved the VOI must:

Submit to the mayor of the "affiliated municipality" a "Management transfer request" of renewable natural resources (art. 9).

The management transfer request is made following a standard formula; the content should be defined in its principle by regulation. The requested information must specify:

- The territorial base of the applying VOI
- Its members
- The list of individuals participating to the deliberations
- Listing of the resources subject to a management transfer
- The decision of the VOI in accordance with the rules governing the community
- The date of the request
- The signature of the representative of the VOI (art. 10).

The VOIs participate in the survey with the competent administration services (art. 12) allowing the local authority to submit a request of management transfer. The investigation should enable the affiliated municipality:

- To verify the existence of the requesting basic local community [VOI] and verify that the community is willing to submit a request of management transfer
- To verify the regularity of the designation and the actual representativeness of the signatory representatives of the application on behalf of the local community [VOI]

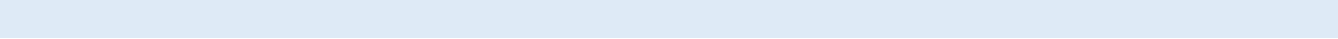
-
- Donations and bequests
 - from the VOI's own activities (art. 20 of the 2000-027 decree)

VOI have to keep a book with the income and expenditures, and the account has to be controlled and approved annually by the General Assembly (art. 21 of the 2000-027 decree).

⁴⁰ *Fokontany* is considered as an administrative subdivision of the municipality. However, its President is nominated by the Chief District on a proposition list from the *fokonolona*.

- Verify the resources situation on the community territory or in the affiliated municipality and determine their nature and consistency
- To finally assess the VOIs management capacity [VOI] (art. 13).

Co-sign the request with the mayor. The competent State Representative of the municipality will transmit the request to the administration in charge of the concerned renewable natural resources in the management transfer request, if a favorable opinion was given by the Community Council after the investigation. The request, developed on the basis of a standard formula established by regulation must specify:

- The resources subject to the transfer request
 - The identity of applying VOIs
 - Mention the reasons that influenced the decision of the municipal council
 - And if so, the priorities that the municipal council considers should be included in the management contracts. (art. 14).
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APPENDIX B. TABLES FOR DEFORESTATION ANALYSES

Table B1. Presence of community forest management areas (CFM), control areas and areas excluded from the analyses in different statuses of forests in Madagascar

Status	CFM	Non-CFM	Excluded
MNP protected areas	No	No	Yes
Extension of MNP protected areas	Yes	No	Yes
Temporary protected areas	Yes	No	Yes
New protected areas	Yes	Yes (if the creation of the protected area has not yet started or is at a very early stage)	Yes (if the stage of creation of the protected area is unknown or advanced)
Public domain	Yes	Yes	No

Table B2. Different analyses and sample sizes

Analysis	Sample size (number of pixels)	
	Intervention	Comparison
Effectiveness of all CFM	CFM: 37 679	Non-CFM: 120 000
Effectiveness of CFM with information suggesting implementation	CFM: 30 000	Non-CFM: 120 000
Effectiveness of commercial CFM	Commercial CFM: 30 000	Non-CFM: 120 000
Effectiveness of non-commercial CFM	Non-commercial CFM: 30 000	Non-CFM: 120 000
Relative effectiveness of commercial and non-commercial CFM in commercial CFM setting	Commercial CFM: 30 000	Non-commercial CFM: 53 528*
Relative effectiveness of non-commercial and commercial CFM in non-commercial CFM setting	Non-commercial CFM: 30 000	Commercial CFM: 45 657*

*Because of the imposed minimum distance between sample pixels, it was not possible to sample comparison pixels two to four times more than intervention pixels. Thus, we sampled the maximum number of pixels that could be generated from the comparison pixel population.

Table B3. Baseline characteristics likely to affect both assignment to CFM and rate of deforestation

Confounding variables	Unit	Source
Agricultural suitability	Pixel 9km*9km	IIASA(Fischer et al., 2002) †
Irrigated rice suitability	Pixel 90m*90m	Ramaharitra Tondrasoa, 2012
Elevation	Pixel 90m*90m	SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Slope	Pixel 90m*90m	Topography Mission SRTM)
Distance to recent deforestation (1990 – 2000)	Pixel 90m*90m	ONE, DGF, CI, FTM and MNP (ONE et al., 2013), SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Distance to forest edge (2000)	Pixel 90m*90m	UN OCHA ROSA (UN OCHA ROSA, 2007) , SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Distance to a village	Pixel 90m*90m	UN OCHA ROSA (UN OCHA ROSA, 2007) , SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Distance to an urban center	Pixel 90m*90m	FTM (Foiben-Taosarintanin'i Madagasikara FTM, 1990), SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Distance to a road	Pixel 90m*90m	FTM (Foiben-Taosarintanin'i Madagasikara FTM, 1990), SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Distance to a cart track	Pixel 90m*90m	FTM (Foiben-Taosarintanin'i Madagasikara FTM, 1990), SRTM Digital Elevation Model (Shuttle Radar Topography Mission SRTM)
Duration of trip to urban center	Commune#	ILO (ILO, 2003)
Population density in 2003	Fokontany#	Vieilledent et al., 2013

†We have reclassified the agriculture constraints levels of IIASA (Table B4)

#Administrative levels in Madagascar from the smallest to the largest: Fokontany, Commune, District, Region, Nation

Table B4. Reclassification of the agriculture constraints levels of IIASA (Fischer et al., 2002)

Level of constraints in IIASA	Reclassification
No constraints	None*
Very few constraints	Suitable for agriculture
Few constraints	Suitable for agriculture
Partly with constraints	Suitable for agriculture
Frequently severe constraints	Unsuitable for agriculture
Very frequent severe constraints	Unsuitable for agriculture
Unsuitable for agriculture	Unsuitable for agriculture

*There is no “no constraints” area in Madagascar

Table B5. Covariate balance for all CFM vs. non-CFM

Variable	Mean CFM	Mean non-CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (percent)				
- Unmatched	18.801	36.798	-17.997	17.997
- Matched	18.801	18.743	0.058	0.058
Unsuitable land for agriculture (%)				
- Unmatched	78.665	61.730	16.935	16.935
- Matched	78.665	78.723	-0.058	0.058
Suitable land for irrigated rice (%)				
- Unmatched	7.710	6.022	1.688	1.688
- Matched	7.710	7.710	0.000	0.000
Slope (degree)				
- Unmatched	6.947	6.488	0.459	0.463
- Matched	6.947	6.945	0.002	0.147
Elevation (m)				
- Unmatched	504.590	423.180	81.410	98.859
- Matched	504.590	511.040	-6.450	14.741
Distance to recent deforestation (km)				
- Unmatched	2.340	3.746	-1.407	1.407
- Matched	2.340	2.149	0.191	0.215
Distance to forest edge (km)				
- Unmatched	0.643	0.369	0.274	0.283
- Matched	0.643	0.555	0.088	0.089
Distance to a village (km)				
- Unmatched	4.792	4.332	0.461	0.465
- Matched	4.792	4.564	0.229	0.287
Distance to a road (km)				
- Unmatched	10.420	11.648	-1.228	1.258
- Matched	10.420	9.835	0.585	0.934
Distance to cart track (km)				
- Unmatched	2.989	3.298	-0.310	0.310
- Matched	2.989	2.982	0.006	0.108
Distance to an urban center (km)				
- Unmatched	60.427	87.909	-27.482	27.507
- Matched	60.427	63.890	-3.463	5.404
Trip to urban center (hour)				
- Unmatched	25.068	32.743	-7.675	10.022
- Matched	25.068	25.273	-0.205	2.146
Population density in 2003 (inh./km ²)				
- Unmatched	14.147	14.469	-0.322	1.391
- Matched	14.147	14.132	0.015	1.020

Table B6. Covariate balance for CFM with information suggesting implementation on the ground vs. non-CFM

Variable	Mean CFM	Mean non-CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (%)				
- Unmatched	13.817	36.798	-22.981	22.980
- Matched	13.817	13.790	0.027	0.027
Unsuitable land for agriculture (%)				
- Unmatched	85.017	61.730	23.287	23.287
- Matched	85.017	85.043	-0.026	0.027
Suitable land for irrigated rice (%)				
- Unmatched	8.817	6.022	2.795	2.793
- Matched	8.817	8.817	0.000	0.000
Slope (degree)				
- Unmatched	6.578	6.488	0.090	0.667
- Matched	6.578	6.654	-0.076	0.192
Elevation (m)				
- Unmatched	532.180	423.180	109.000	138.900
- Matched	532.180	540.610	-8.430	21.194
Distance to recent deforestation (km)				
- Unmatched	2.535	3.746	-1.211	1.212
- Matched	2.535	2.309	0.226	0.255
Distance to forest edge (km)				
- Unmatched	0.704	0.369	0.335	0.342
- Matched	0.704	0.607	0.097	0.098
Distance to a village (km)				
- Unmatched	5.181	4.332	0.849	0.853
- Matched	5.181	4.882	0.299	0.359
Distance to a road (km)				
- Unmatched	11.896	11.648	0.248	0.970
- Matched	11.896	11.089	0.807	1.296
Distance to cart track (km)				
- Unmatched	3.007	3.298	-0.291	0.293
- Matched	3.007	3.025	-0.018	0.152
Distance to an urban center (km)				
- Unmatched	59.889	87.909	-28.020	28.020
- Matched	59.889	64.667	-4.778	7.364
Trip to urban center (hour)				
- Unmatched	31.370	32.743	-1.373	7.189
- Matched	31.370	30.543	0.827	3.029
Population density in 2003 (inh./km ²)				
- Unmatched	11.525	14.469	-2.944	3.268
- Matched	11.525	11.782	-0.257	1.035

Table B7. Covariate balance for commercial CFM vs. non-CFM

Variable	Mean commercial CFM	Mean non-CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (%)				
- Unmatched	0.000	27.956	-27.956	27.957
- Matched	0.000	0.000	0.000	0.000
Unsuitable land for agriculture (%)				
- Unmatched	1.000	70.539	29.461	29.463
- Matched	1.000	1.000	0.000	0.000
Suitable land for irrigated rice (%)				
- Unmatched	23.310	7.216	16.094	16.093
- Matched	23.310	23.310	0.000	0.000
Slope (degree)				
- Unmatched	9.702	8.157	1.546	1.550
- Matched	9.702	9.711	-0.009	0.205
Elevation (m)				
- Unmatched	731.570	519.200	212.370	241.450
- Matched	731.570	721.950	9.620	29.690
Distance to recent deforestation (km)				
- Unmatched	1.499	4.412	-2.913	2.921
- Matched	1.499	1.667	-0.168	0.169
Distance to forest edge (km)				
- Unmatched	0.822	0.386	0.437	0.458
- Matched	0.822	0.677	0.145	0.145
Distance to a village (km)				
- Unmatched	3.112	4.542	-1.431	1.431
- Matched	3.112	3.131	-0.019	0.090
Distance to a road (km)				
- Unmatched	7.256	13.118	-5.862	5.959
- Matched	7.256	7.178	0.078	0.494
Distance to cart track (km)				
- Unmatched	2.233	3.691	-1.457	1.457
- Matched	2.233	2.458	-0.224	0.226
Distance to an urban center (km)				
- Unmatched	34.614	71.736	-37.222	37.227
- Matched	34.614	42.464	-7.850	7.883
Trip to urban center (hour)				
- Unmatched	14.704	32.283	-17.579	17.804
- Matched	14.704	13.972	0.732	4.999
Population density in 2003 (inh./km ²)				
- Unmatched	19.281	13.689	5.592	7.658
- Matched	19.281	19.482	-0.201	2.366

Table B8. Covariate balance for noncommercial CFM vs. non-CFM

Variable	Mean noncommercial CFM	Mean non-CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (%)				
- Unmatched	29.437	27.842	1.595	1.593
- Matched	29.437	29.380	0.057	0.057
Unsuitable land for agriculture (%)				
- Unmatched	70.430	70.743	-0.313	0.313
- Matched	70.430	70.487	-0.057	0.057
Suitable land for irrigated rice (%)				
- Unmatched	14.923	7.168	7.755	2.793
- Matched	14.923	14.923	0.000	0.000
Slope (degree)				
- Unmatched	6.402	8.090	-1.688	1.699
- Matched	6.402	6.455	-0.053	0.236
Elevation (m)				
- Unmatched	731.470	515.330	216.140	279.240
- Matched	731.470	725.580	5.890	45.265
Distance to recent deforestation (km)				
- Unmatched	1.743	4.409	-2.666	2.677
- Matched	1.743	1.663	0.080	0.237
Distance to forest edge (km)				
- Unmatched	1.177	0.387	0.790	0.794
- Matched	1.177	1.044	0.133	0.133
Distance to a village (km)				
- Unmatched	4.657	4.542	0.114	0.587
- Matched	4.657	4.389	0.268	0.315
Distance to a road (km)				
- Unmatched	12.098	13.087	-0.989	1.706
- Matched	12.098	12.481	-0.383	0.726
Distance to cart track (km)				
- Unmatched	2.778	3.700	-0.922	0.992
- Matched	2.778	3.074	-0.296	0.304
Distance to an urban center (km)				
- Unmatched	47.020	71.739	-24.719	25.727
- Matched	47.020	51.129	-4.109	4.751
Trip to urban center (hour)				
- Unmatched	17.212	32.346	-15.134	17.092
- Matched	17.212	17.487	-0.275	6.447
Population density in 2003 (inh./km ²)				
- Unmatched	9.651	13.599	-3.948	6.719
- Matched	9.651	9.559	0.091	2.327

Table B9. Covariate balance for commercial CFM vs. noncommercial CFM

Variable	Mean commercial CFM	Mean noncommercial CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (%)				
- Unmatched	0.000	29.207	-29.207	29.207
- Matched	0.000	24.620	-24.620	24.966
Unsuitable land for agriculture (%)				
- Unmatched	1.000	70.625	29.375	29.377
- Matched	1.000	75.380	24.620	24.966
Suitable land for irrigated rice (%)				
- Unmatched	23.310	14.779	8.531	8.530
- Matched	23.310	23.107	0.203	0.187
Slope (degree)				
- Unmatched	9.702	6.462	3.240	3.240
- Matched	9.702	9.384	0.318	0.412
Elevation (m)				
- Unmatched	731.570	731.240	0.330	101.980
- Matched	731.570	680.350	51.220	51.522
Distance to recent deforestation (km)				
- Unmatched	1.499	1.729	-0.230	0.236
- Matched	1.499	1.264	0.235	0.252
Distance to forest edge (km)				
- Unmatched	0.822	1.163	-0.340	0.340
- Matched	0.822	0.796	0.026	0.044
Distance to a village (km)				
- Unmatched	3.112	4.617	-1.505	1.505
- Matched	3.112	3.298	-0.186	0.235
Distance to a road (km)				
- Unmatched	7.256	12.139	-4.883	4.964
- Matched	7.256	6.318	0.938	1.061
Distance to cart track (km)				
- Unmatched	2.233	2.763	-0.530	0.530
- Matched	2.233	2.133	0.100	0.176
Distance to an urban center (km)				
- Unmatched	34.614	46.922	-12.308	12.31
- Matched	34.614	44.160	-9.546	9.541
Trip to urban center (hour)				
- Unmatched	14.704	17.205	-2.501	2.806
- Matched	14.704	15.436	-0.732	0.808
Population density in 2003 (inh./km ²)				
- Unmatched	19.281	9.688	9.593	10.297
- Matched	19.281	17.908	1.373	3.613

Table B10. Covariate balance for noncommercial CFM vs. commercial CFM

Variable	Mean noncommercial CFM	Mean commercial CFM	Difference of means	Mean raw eQQ difference
Suitable land for agriculture (%)				
- Unmatched	29.437	0.000	29.437	29.437
- Matched	29.437	0.000	29.437	28.669
Unsuitable land for agriculture (%)				
- Unmatched	70.430	1.000	-29.570	29.570
- Matched	70.430	1.000	-29.570	28.797
Suitable land for irrigated rice (%)				
- Unmatched	14.923	23.475	-8.552	8.550
- Matched	14.923	14.923	0.000	0.000
Slope (degree)				
- Unmatched	6.402	9.659	-3.257	3.256
- Matched	6.402	6.619	-0.217	0.435
Elevation (m)				
- Unmatched	731.470	515.330	216.140	279.240
- Matched	731.470	725.580	5.890	45.265
Distance to recent deforestation (km)				
- Unmatched	1.743	1.495	0.249	0.249
- Matched	1.743	1.378	0.365	0.371
Distance to forest edge (km)				
- Unmatched	1.177	0.805	0.372	0.372
- Matched	1.177	1.141	0.036	0.057
Distance to a village (km)				
- Unmatched	4.657	3.093	1.563	1.563
- Matched	4.657	4.159	0.497	0.633
Distance to a road (km)				
- Unmatched	12.098	7.193	4.905	4.973
- Matched	12.098	10.837	1.261	1.805
Distance to cart track (km)				
- Unmatched	2.778	2.240	0.538	0.538
- Matched	2.778	2.517	0.261	0.345
Distance to an urban center (km)				
- Unmatched	47.020	34.720	12.300	12.306
- Matched	47.020	42.138	4.882	4.983
Trip to urban center (hour)				
- Unmatched	17.212	14.506	2.706	2.994
- Matched	17.212	17.252	-0.040	0.723
Population density in 2003 (inh./km ²)				
- Unmatched	9.651	19.534	-9.883	10.560
- Matched	9.651	11.437	-1.786	3.252

APPENDIX C. LIMITATIONS OF USING 2000 BASELINE FOREST COVER AND CFM ESTABLISHED BETWEEN 2000 AND 2005

Ideally, baseline confounding characteristics, particularly baseline forest cover, should be measured at the very time CFM is established (Andam et al., 2008). In this study, baseline forest cover is dated in 2000 while CFM are established from 2000 to 2005. When planners establish CFM, they make decision based on the landscape they are facing. They are likely to establish CFM in location where there are forests at the time of establishment. Thus, if a CFM was established after 2000, it was likely to be forested in that post-2000 year of establishment while its counterfactual, which was forested in the 2000 baseline may already be deforested in the post-2000 year of establishment. The fact that the CFM was still forested in the post-2000 year of establishment could signify that it unobservably has smaller deforestation probability than its counterfactual, which was already cleared. While matching can control for observable bias, it cannot deal with this kind of unobservable bias. That CFM could unobservably have smaller deforestation probability than its counterfactual means that our impact estimates can be considered as upper bounds. That is, if the probability of deforestation of the intervention and its counterfactual were the same, effectiveness of the intervention would be smaller. Where intervention has no significant effect, this will not change the conclusion that it is ineffective. However, where there is significant effect, this means that the effect estimate can be smaller. For the latter, the sensitivity tests to unobservable bias provide means to know how sensitive an estimate is to potential unobservable bias.

APPENDIX D. TYPES OF VEGETATION IN MADAGASCAR

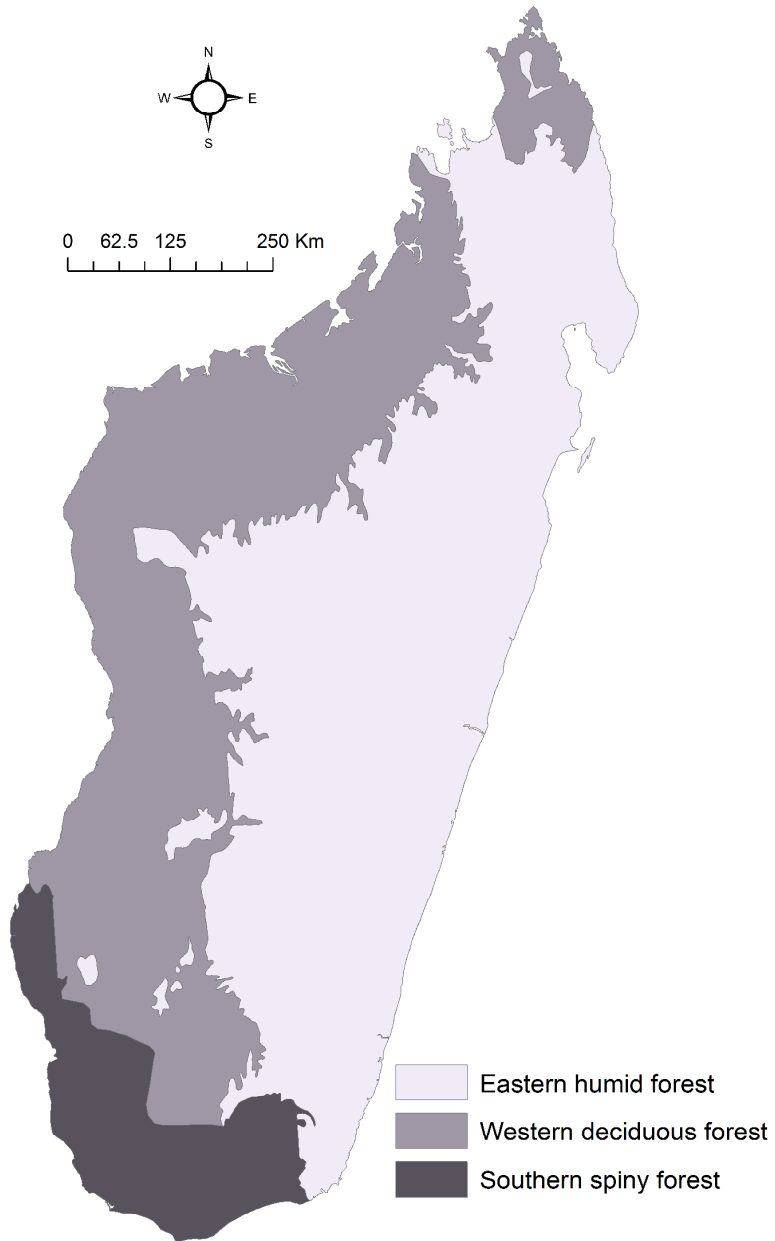


Figure D1. Three major types of vegetation in Madagascar

(Sources: Moat and Du Puy, 1997; Schatz and Lescot, 2003; Projection: Laborde Madagascar)

APPENDIX E. TABLE FOR WELL-BEING ANALYSES

Covariate balance for CFM vs. non-CFM households

Variable	Mean CFM	Mean non-CFM	Difference of means	Mean raw eQQ difference
Male household head (%)				
- Unmatched	79.698	77.848	1.850	1.852
- Matched	79.698	82.647	-2.949	3.042
Household head age (years)				
- Unmatched	41.690	41.998	-0.308	0.529
- Matched	41.690	41.433	0.257	1.134
Single female household head (%)				
- Unmatched	17.833	19.480	-1.647	1.646
- Matched	17.833	16.804	1.029	0.992
Household head with no education (%)				
- Unmatched	66.735	65.533	1.202	1.235
- Matched	66.735	67.353	-0.618	0.661
Household head with primary education (%)				
- Unmatched	24.005	22.784	1.221	1.235
- Matched	24.005	23.457	0.548	0.595
Household head with secondary education (%)				
- Unmatched	9.259	11.683	-2.424	2.400
- Matched	9.259	9.191	0.068	0.066
Household with children under five (%)				
- Unmatched	45.885	46.247	-0.362	0.343
- Matched	45.885	45.336	0.549	0.529
Household with disable over 5 (%)				
- Unmatched	2.400	2.648	-0.248	0.274
- Matched	2.400	2.400	0.000	0.000
Household in arid zone (%)				
- Unmatched	20.027	24.824	-4.797	4.801
- Matched	20.027	20.027	0.000	0.000
Household in cyclonic zone (%)				
- Unmatched	37.106	32.062	5.044	5.075
- Matched	37.106	37.106	0.000	0.000
Commune forest area (km ²)				
- Unmatched	301.660	185.580	116.080	116.310
- Matched	301.660	229.200	72.460	75.186
Commune forest proportion (%)				
- Unmatched	34.685	24.729	9.956	9.954
- Matched	34.685	31.297	3.388	3.908
Commune average slope (degree)				
- Unmatched	6.179	5.924	0.255	0.838
- Matched	6.179	6.556	-0.377	1.048
Commune maximum slope (degree)				
- Unmatched	36.593	35.373	1.220	4.059
- Matched	36.593	38.276	-1.683	5.351
Commune average elevation (m)				
- Unmatched	472.920	395.770	77.150	88.788
- Matched	472.920	510.490	-37.570	45.062
Commune maximum elevation (m)				
- Unmatched	951.470	845.910	105.560	136.660
- Matched	951.470	966.060	-14.590	85.282
Commune land suitable for irrigated rice (%)				
- Unmatched	11.642	11.225	0.417	4.032

- Matched	11.642	11.300	0.342	2.396
Commune roadless volume (km ³)				
- Unmatched	8084.40	8722.10	-637.70	2175.40
- Matched	8084.40	7847.40	237.00	2503.30
Commune cart trackless volume (km ³)				
- Unmatched	2214.80	2352.50	-137.70	329.16
- Matched	2214.80	2095.50	119.30	402.70
Commune population density (inh/km ²)				
- Unmatched	34.721	38.567	-3.846	7.337
- Matched	34.721	29.801	4.920	4.874
Protected forest proportion (%)				
- Unmatched	10.598	10.967	-0.369	2.637
- Matched	10.598	7.182	3.416	5.024
Duration of trip to an urban center (hours)				
- Unmatched	19.598	31.341	-11.743	11.789
- Matched	19.598	18.364	1.234	5.8627

APPENDIX F. MATCHING, UNIT OF ANALYSIS, SAMPLING AND OUTCOME VARIABLE FOR ANALYSIS OF CFM ON DEFORESTATION

Conservation interventions like CFM are not randomly assigned. The site characteristics that affect where conservation interventions are assigned also affect deforestation, thus confounding attempts to estimate intervention impacts (Ferraro and Pattanayak 2006). To control these confounding factors, some empirical studies have used matching (Andam et al. 2008; Joppa and Pfaff 2011). Matching selects comparison areas that are similar to the intervention areas in terms of values of the confounding factors at the pre-intervention baseline. Thus, one assumes that the outcomes of the comparison group represents, in expectation, the counterfactual outcomes of the conservation sites had they not been exposed to the conservation intervention.

The unit of analysis is a forested pixel from the 2000 forest cover baseline (Appendix C for limitations of using 2000 baseline forest cover and CFM established between 2000 and 2005, and Appendix B for how we deal with potential pseudo-replication in which pixels within a particular CFM are not independent). For each forested pixel at baseline, covariates take the values of each confounding characteristic at that pixel location. For each analysis (Table 2), we selected random forested pixels in intervention areas. Then, we used matching⁴¹ to pair each randomly selected pixel with the most similar pixel in comparison areas in terms of covariates. The outcome variable is whether a pixel remained forested or not in the 2010 land cover. The estimated difference in deforestation between intervention and similar comparison areas represents the impact of the intervention on deforestation for intervention sites or the Average Treatment effect on the Treated (ATT). We used independent samples T-test to compare deforestation in intervention and similar comparison or counterfactual areas.

We performed exact matching on vegetation zones (eastern humid, western deciduous and southern spiny forests, Appendix D). We executed bias adjustment regression to correct for any remaining post-matching covariate imbalance (Abadie and Imbens 2006). We used the “matching” package in R (Sekhon 2011).

We aimed to select sample sizes that balance our interests in achieving high statistical power and reducing computer processing time. Learning from multiple trial analyses, we decided on a sample of around 30,000 pixels for all intervention areas in each analysis. For comparison areas, we sampled around two to four times more pixels (Appendix B Table B2). The larger sample size from comparison areas increases the probability of finding a good match for each intervention pixel.

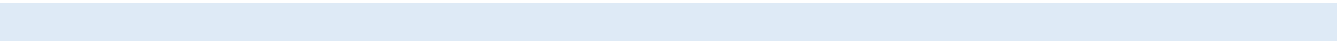
F1. COVARIATES OR CONFOUNDING BASELINE CHARACTERISTICS

Based on Madagascar CFM practitioners’ opinion, and CFM and deforestation studies in Madagascar and other tropical countries (Barsimantov and Kendall 2012; Bowler et al. 2012; Forrest et al. 2008; Gorenflo et al. 2011; Sussman et al. 1994), we identified pressure and access as potentially confounding factors. To control for these factors, we used measures of agricultural suitability, slope, elevation, distance to recent deforestation (1990 – 2000), distance to forest edge, distance to a village, distance to an urban center, distance to a road, distance to a cart track, duration of trip to the nearest urban center and population density (see Appendix B Tables B3, B4 for sources of covariate data). Because community characteristics received little consideration in selection of communities for CFM designation, we did not consider community characteristics as confounding factors but only condition on these site characteristics indicating pressure and access (see Appendix G).

⁴¹ One to one matching with replacement; Mahalanobis covariate matching because it better balances covariates than other matching algorithms.

F2. SENSITIVITY ANALYSIS TO UNOBSERVABLE BIAS

While matching can ensure that the distributions of observable covariates are similar between intervention and comparison groups, the groups may still differ in terms of unobserved covariates that affect both deforestation and assignment to intervention. To check the robustness of our estimates of effectiveness to such unobservable covariates, we performed Rosembaum's (2010) sensitivity test. A parameter Γ measures the dissimilarity in the likelihood of receiving intervention between intervention and counterfactual units due to unobservable covariates. In the absence of unobservable differences, Γ takes the value of one. The higher the value of Γ , the more dissimilar is the likelihood of receiving intervention for the matched pair due to unobserved variables. The sensitivity analysis consists of increasing the values of Γ and determining a critical Γ at which the estimate of effect of intervention is not significantly different from zero. In other words, we seek to measure how strong an unobservable confounder would have to be in degree for the estimated effect not to be significantly different from zero. The higher the value of the critical Γ , the more robust is the estimate of intervention effect to unobservable bias. We carry out sensitivity tests with the "rbounds" package in R (Keele 2010).



H1. MATCHING AND POST-MATCHING ANALYSES

In addition to the non-random location of CFM across landscapes (Ferraro and Pattanayak 2006; Rasolofson et al. 2015), households may not randomly choose to live in CFM areas. Certain household characteristics may make households more or less likely to live in CFM areas (Bandyopadhyay and Tembo 2010). The site and household characteristics that affect where CFM is located and where a household chooses to live may also affect household per capita consumption and thus confound the estimate of CFM impacts. Matching⁴² pairs a CFM household with a non-CFM household that are similar in terms of the site and household confounding characteristics. Because after matching, ideally, the only difference between CFM and non-CFM households is CFM intervention, one can assume that the non-CFM household consumption expenditure equates the counterfactual consumption expenditure if there had been no CFM intervention. Thus, the difference in consumption expenditure in CFM and similar non-CFM households represents the impact of CFM on consumption expenditure for the CFM households or Average Treatment effect on the Treated (ATT).

We performed exact matching on the year when the data were produced (2010 or 2012), arid and cyclonic areas. We undertook matching with the “matching” package in R (Sekhon 2011).

Matching does not usually produce perfect characteristics balance. To adjust for the remaining post-matching imbalance, we performed regression⁴³ on the matched CFM and non-CFM households. Studies show that combination of matching and regression may yield more accurate estimate than either of them alone (Ferraro and Miranda 2014). We used the lme4 package in R to execute the post-matching regression (Bates et al. 2014).

H2. FALSIFICATION OR PLACEBO TEST

We do not have information on household consumption expenditure at the baseline (when the intervention was first implemented). Although there had been previous living standard surveys, these were with a different sample of households (i.e. no panel data on living standards is available for Madagascar). This is an important unobservable confounding variable because CFM households may be poorer (or richer) because they were already poorer (or richer) at baseline. To address this issue, we performed the so-called falsification or placebo test (Ferraro and Hanauer 2014). The idea is to test whether the baseline observable confounding characteristics we used are rich enough to capture the missing baseline household consumption expenditure. In other words, we tested whether CFM and similar non-CFM households that are matched in terms of the observable characteristics have similar consumption expenditure in the absence of CFM intervention. We used data from EPM 2005, a household survey similar to EPM 2010 and ENSOMD 2012 that was carried out in 2005 on different randomly sampled households. We selected all CFM units established after 2005. Then, we selected the treated and untreated households for those CFM units. Finally, we executed matching and post-matching analysis similar to what we did for the EPM 2010 and ENSOMD 2012 data. None of those households were under CFM intervention in 2005. If consumption expenditures in 2005 are similar for these treated and untreated households, then matching on our observed characteristics ensures that matched treated and untreated households have similar consumption expenditure in absence of CFM intervention. Thus, we can have higher confidence that matched treated and untreated households for the EPM 2010 and ENSOMD 2012 data have similar consumption expenditures at baseline when there also was no intervention. If the household consumption expenditures in 2005 are different, then the two groups of

⁴² One to one matching with replacement; genetic matching because it yields better covariate balance than other matching algorithms.

⁴³ Weighted mixed effects linear regression with commune as random intercept.

households may have different consumption levels at the baseline. That difference may bias our impact estimate. But we may use the result of the falsification test to explore the implications of the bias for the impact estimates.

H3. HETEROGENEOUS IMPACTS OF CFM

Because of raised concerns that the impact of CFM is heterogeneous for different types of households we explored the impact conditional on household location. Conditional impact evaluation can be done by dividing households into theoretically motivated or policy-relevant subgroups and then, investigating the impact in each subgroup to see if it is heterogeneous across the different subgroups (Ferraro and Hanauer 2014). Communities managing the forests are often located along forest edges. It is also reasonable to think that households living closer to forest edges are more directly affected by CFM than those living farther. To reflect this potential heterogeneity of impacts as a function of household location (spatial distribution of impact), we divided the sampled households into two subgroups: households within 3 km from forest edges and households beyond 3 km from forest edges. We then investigated CFM impacts in the subgroup within 3km from forest edges. We could not do the same for the subgroup beyond 3 km from forest edge because there are not enough non-CFM households for the analysis to be carried out.

H4. CONFOUNDING CHARACTERISTICS OR COVARIATES

In Madagascar and other tropical countries, pressure and access are potential site confounding characteristics that affect both assignment of forests to CFM (Rasolofoson et al. 2015) and household consumption (Andam et al. 2010; Bandyopadhyay and Tembo 2010). We used measures of variables in Table 4 to control for these site confounding characteristics. All these variables were measured at baseline.

Household characteristics that may influence where households choose to live and their consumption (Bandyopadhyay and Tembo 2010) are listed in Table 4. These variables were selected as matching covariates because either they can be brought back to baseline thanks to some household information collected in the EPM 2010 and ENSMOD 2012 surveys (number of children under 5) or they are unlikely to be affected by CFM intervention (household head gender, household head age, single female household head, household head education level, presence of disabled individual over 5 years old).

Table H5. Confounding characteristics

	Variables	Unit
Site characteristics	Slope (average, maximum)	Commune
	Elevation (average, maximum)	Commune
	Roadless volume	Commune
	Cart trackless volume	Commune
	Suitable for irrigated rice	Commune
	Area of forest land	Commune
	Duration of trip to the nearest urban center	Commune
	Population density	Commune
	Proportion of forest protected areas (MNP)	Commune
	Proportion of forest land	Commune
Household characteristics	Household head age	Household
	Household head education level	Household
	Household head gender	Household
	Single female household head	Household
	Children under 5	Household
	Number of disabled (5 years old or more)	Household

Insignificant or even harmful impacts of the CFM policy on natural forests in Madagascar could justify the development of a radical conservationist policy (isolation of all natural forests of Madagascar). However, this option is necessarily based on a considerable strengthening of the states' control and coercive capacity (or even the private sector capacity) and seems unrealistic except if considering the advent of a totalitarian system and a total control of human pressures on natural forests. Indeed, an effective prohibition of access to natural forests to the rural population in order to maintain social peace and food security would imply the mobilization of considerable resources in the very short term: only titanic investments would drastically reduce the dependence of the rural population towards forest resources. Furthermore, it would be necessary for companies still largely anchored on "traditional" values, to quickly capture a large number of technical and institutional innovations.

Recognizing these constraints and willing to align national politics with the guidelines promoted by the United Nations, the government of Madagascar has developed a National Development Plan (NDP) for the period 2015-2019 based on an inclusive and green economy and putting natural capital at the center of the vision for the country. The objective is to *"build a new and strong Madagascar and to transmit to future generations a peaceful, united and prosperous country able to become a world leader in the valorization and the preservation of its immense natural capital based on a strong inclusive growth at the service of sustainable and equitable development of all territories."* This formulation is based on an empirical construction of the Malagasy institutional framework which, despite the presence of some precursors (especially in the environmental sector,) has actually only been initiated in the 2000s. The process is still young. This, combined with the successive political crises, explains that these ambitions are based on cross-sectoral work that remains to be built. The implementation of CFM, while participating to the effort of integrating environment into public policy, highlights the obvious absence of synergy in the sector.

I.1. THE UNFINISHED CONSTRUCTION OF A FAVORABLE INSTITUTIONAL ENVIRONMENT FOR THE IMPLEMENTATION OF CFM

In 1996, the GELOSE law is passed in a highly centralized institutional context. The first laws on decentralization from 1993 and the 'new' forest policy will emerge a year later. As precursors, management transfers will have to wait many years to enroll in an institutional framework allowing the necessary synergies between public policies.

The gradual establishment of a cross-sectoral consistency in public policy statements

The Decentralization and Devolution policy initiated by the Malagasy State has been formulated in the Letter of Decentralization Policy and Devolution (LP2D) in 2005. This policy aims at establishing democratic decentralized governance embodied by the National Decentralization and Devolution Program (PN2D). One of the main objectives of the policy is to make CTDs efficient actors in the promotion of sustainable development, particularly in terms of sustainable management of natural resources and environment. Also, CTDs (municipalities, regions, provinces) are invited to participate in the management of forest resources located in their territory through the participation of the local population.

The devolved levels of the administration are involved to control CTDs actions on their legal aspects. In the case of the forest administration, the increased responsibility of these decentralized administrative levels is expected to allow them to get more involved in monitoring, control, and support of the various forest manager delegates, including VOIs. Thus, forest cantonments should for example ensure such monitoring and control at the local level, while regional directorates in charge of forests represent the central government when signing management transfer contracts.

The 2006 National Policy on Urban Planning (PNAT) follows the Strategic Document for the Fight against Poverty, which clearly stated the objective of "rational management of forest resources by communities" 2004. The PNAT emphasizes the need for development sectors to align with forest and environmental texts, explicitly citing the COAP and the forest law.

This perspective is reaffirmed in the **2008 National Rural Development Program (PNDR)**. The environmental degradation is considered a blocking factor for several reasons. The "overuse or skimming of forestry and fishery resources," the "reduction of pastures ", the declining soil fertility or the obsolescence and non-implementation of legislation, including forestry, and insufficient coordination of the disengagement of the state are highlighted. In order to "preserve natural factors of production", it is recognized that "a greater participation of the poor in environmental management, programming, implementation, monitoring and decision making, leads the population to invest in reducing poverty while respecting the environment. " However, the established Committees for the implementation of this national program, although systematically incorporating environmental sectors, are not yet recognized at the municipal level.

This oversight was corrected by **the revision of laws on decentralization in October 2014**: these texts reaffirm the role of municipalities, particularly when it comes to municipal planning, which is seen as a pillar of sustainable management of natural resources. According to the law, municipalities are vested with the role of setting up operations to protect natural resources, particularly to prevent and fight against bush fires and deforestation (Art. 24 of Law No. 2014-018 °). However, given the municipalities lack of resources (financial, human, technical...), the implementation of these actions is solely based on the establishment of partnerships with different actors (VOIs, organizations, NGOs, external donors ...). Texts on CFM in Madagascar allow municipalities to be stakeholders for management transfer contracts regarding follow-ups with the forest administration, as well as the control and the protection of VOIs. Moreover, CTDs contribute to a redistribution of income generated by the valuation of PFL and PFNLs through the introduction and management of rebates, and should ensure farms sustainability altogether with the forest administration. Thus, the CBRM seems to be in line with the decentralization policy as a local factor of development. However, the reference to communities is not explicit in **the General State Policy (PGE) validated in May 2014**, despite the fact that it emphasizes the importance of the synergy of agricultural production and environmental protection to revitalize the rural world. It states that "Madagascar in 2025 will rely on a competitive and sustainable agricultural production including family farms and industrial units modernized to ensure food security and conquer export markets ".

The bill currently under development at the State Department in charge of presidential projects, urban planning and equipment (MEPATE) considers the revision of the 2006 PNAT and incorporates many provisions favorable to a better effectiveness of Madagascar CFM. While using certain provisions of Ordinance 62-123 on the classification of areas for forestry, agricultural or pastoral, it specifies that it is important to define the purpose of the land, as well as sectoral services and different implementation structures purposes. Furthermore, it highlights the importance of the contribution of all development actors, including the decentralized departments, the private sector and the civil society to the various committees established to implement territory development plans. These development plans are developed for 15 years period at the communal, regional, interregional levels and for a 20 years period at the provincial and national levels. They set at least at the regional and interregional levels, "the principles of occupation and land use, including agricultural soils, the zones to preserve and land reserves" (art. 39). We note that important decisions must be taken at the local level regarding "large areas " and "land reserves". At this level, technical services and support organizations can play a crucial role in the defense and promotion of CFM. Moreover, civil society organizations are represented in the Planning National Committee (CNAT) and may also play an advisory role on strategic directions for the national land policy. The stakes are high as support organizations will not only defend CFM as a unit of land occupation, but will also take advantage of the complementarity of different development sectors so that the CFM can benefit from this synergy. Please also note interesting prospects for VOIs implementation of Art 6 of the bill stating that "agriculture must have enough space for crop rotation." In forest areas, the first factor of degradation is slash-and-burn agriculture. This practice is based on the need to have enough space for agricultural crop rotation, and therefore the inclusion of more or less ancient fallow lands that are traditionally overtook by the local population despite rules set by the forest law (Ordinance 60-127). The sixth principle is probably a point to be addressed in the upcoming negotiations in the development and respect of different urban plans.

However, the formalization and implementation of this policy faces the powerful lobbying of areas inspectors who are opposing themselves to the reduction of their powers in favor of CDTs, whose performances are mixed when it comes to protecting land property.

The lack of integration of the specificity of forest land in land policy

According to GELOSE law, VOIs are supposed to manage some RNR within the limits of their territory on lands belonging to the State or Local Authorities (art. 1 & 2 of the GELOSE law in relation to paragraph 101 of Decree 1997-1200).

However, the **2005 Land Reform** toppled the regime of proof in regards to the presumption of State ownership: previously, all empty and ownerless land belonged to the State, that is to say that all land non-titled or non-registered by individuals was supposed to belong to the state (except of course for titled and registered lands in favor of other public entities). After the land reform of 2005, lands occupied by individuals may be subject to be recognized as private properties by municipalities. This new land management actor was granted with a new role as a warrantor of land ownership, while this role was only attributed to the State before the land reform. These provisions have increased inconsistencies between land rights and forest law, even if they were established with the aim to promote rural development.

Thus, the **2008-014 Law on private State, Local Authorities and Public Institutions Property** requires that lands constituting the private domain of these public entities get registered. But forests registered at the national, provincial, regional or municipal forest are rare despite existing texts (Aubert, 2012). In this context, it is legally not obvious that forest resources that are not explicitly included in the State and local authorities private domain (registered) may be in favor of a management transfer profitable to communities, especially since the decree regarding the inventory of all existing forests on the national territory (art. 35 of Law 97-017) has not yet been published (Aubert, 2013).

Furthermore, the forest commissions responsible for recognizing the nature of the forest land (Decree 2005-849) for eventual submission to the forest system are not functional. Moreover, the land administration fails at requesting the presence of a representative of the forest administration when engaging in land recognitions which constitutes the first step of establishing private property. This solicitation is legal but is not systematically requested by decentralized authorities.

It is therefore often difficult to identify forests owners that could be subject to a management transfer contract under the forest regime. This situation is especially problematic as the decree establishing the relative land security (Decree 98-610) was mobilized only in rare cases. The decree gives the opportunity to communities to mark off their land and have decentralized services register the limits and should be in line with the provisions of the land property reform and the bill for revision of urban planning currently under development.

This insecurity for the land property administration, the communities and of all forest loggers is problematic for the organization of networks because it puts the legal exploitation of forest products in a particularly unclear situation: Operators obligations (reforestation, royalties' payments, traceability ...) can hardly be implemented. However, the identification of exclusive rights on lands and RNR explicitly redistributed in lands of those involved in forest management is a fundamental guarantee to the conservation of resources, particularly in a valorization context (Leroy, 2013).

Also, the establishment of a specific tenure for land under forest law, renewable natural resource management agreements (including management transfers), and protected areas is required. Yet this regime described under Article 38 of the Law 2005-019 on the status of land property in Madagascar, has not yet been translated into a concrete law. Its wording should be considered as part of the national land property program that will allow the implementation and the consolidation of land property policy letter 2015-2030 which was formalized by the Governmental Council on 9 March 2015 (the finalized version is however not available to the public).

Incompressible wood energy demands in the short term and the threat of a "mining" State

The Law of 10/12/2014 regarding the updated Malagasy Environmental Charter (Act No. 047/2014), defines in its preamble natural resources as the basis for economic and social sustainable development and also mentions the "need to

preserve biodiversity and natural resources." The guarantee of the socio-economic wellbeing of local communities is one of the objectives of economic development, ideally combined with good environmental governance. Alongside the State and the CTDs, local communities, the private sector, but also technical and financial partners, are explicitly asked to respect the principles of fairness and responsibility particularly in searching for sustainable funding and assisting actors in the long term. These provisions are explicitly designed to promote the integration of the environment into all public policies. Implicitly, they call for the environmental responsibility of actors to influence activities in two sectors of great importance for the development of the country development: energy and mining.

In this context, the Ministry of Energy and Hydrocarbons receives financial support from the European Union and the World Bank to develop a **New Energy Policy for Madagascar**. The vision of this policy focuses on "access to energy for all and at a lower cost." In the draft of the new policy orientation, two out of eight strategic axes have an implicit link with CFM: (1) the promotion of rural electrification valuing renewable energy and (2) the reduction of energy consumption extracted from wood products. Although the operational dispositions of this political document are not yet known, it is conceivable that the effects and impacts of rural electrification will indirectly contribute to the reduction of deforestation and forest degradation. Forest sites affected by community management could benefit from the positive impacts of this initiative. According to an interview with officials from the Ministry, the challenge is to increase by 50% the rate of electrification in rural areas in 2030, and to reduce the rate of wood energy use from 92% in 2012 (AIDES) to 50% in 2050.

Finally, the Madagascar wealth in mineral and oil resources and the financial issues they represent constitute significant threats for natural forests and for political stability, considering the significant risks of corruption that could generate this financial windfall (World Bank, 2010).

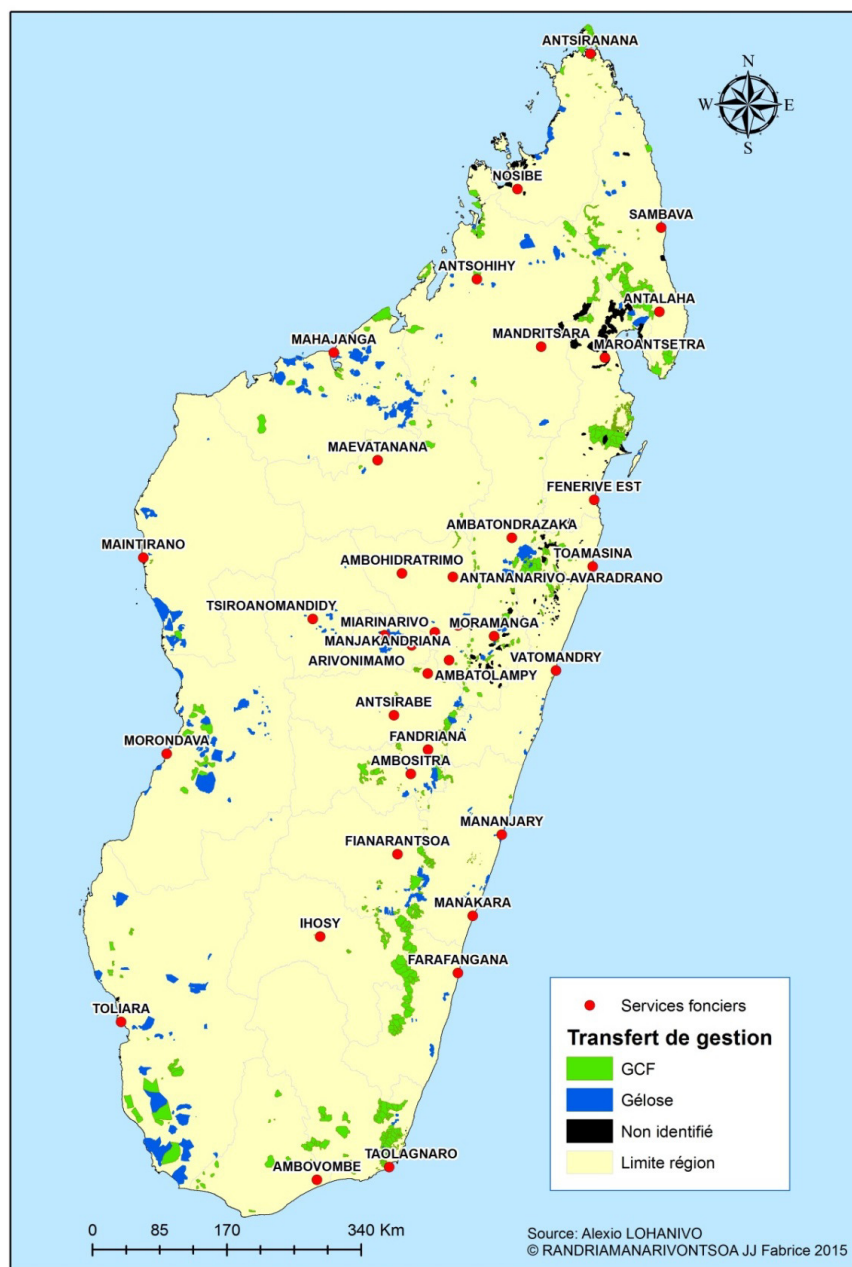
The Mining And Oil Policy Framework produced in 2014 by the Ministry at the Presidency in charge of strategic resources, however, highlights the obligation of the State to find a compromise between economic growth [as a result of mining or oil operations] and preserving the interests of future generations [referring to environmental sustainability]. A cohabitation between mining and environment should be considered in order to promote "alternative livelihoods around PAs, encouraging the participation of miners." We note that formulated this way, this cohabitation could be beneficial to the CFM for local populations surrounding PAs, including mixed PA, in areas presenting a mining potential. This perspective does not, however, apply to communities located far from PAs. Many conflicts persist due to the overlapping of mining licenses with many land occupations and assignments of forests, particularly in the context of CFM. In this context, the provisions of the Mining Code (Law 99-022 as amended and its implementing decree 2006-910) are very favorable to miners that can get expropriation in the public interest even with legal owners, if experiencing difficulties to access mineral resources. Furthermore, the absence of written evidence of occupancy rights of land and forests will not give right to the payment of compensations related to the loss of forest resources.

APPENDIX J. ASSESSMENT OF STAKEHOLDERS' IMPORTANCE AND INFLUENCE RELATED TO CFM

Stakeholders	Level of importance and rationale		Level of Influence and justification	
Municipality (commune)	2.5	The municipality theoretically guarantees the existence, as well as the social and economic viability of the VOI; it signs the CFM contract and acknowledges the « <i>dina</i> ». The municipality also participates in the monitoring and control of CFM.	3	It represents the territorial authority and derives its legitimacy of the electoral process. It plays an important role in the management of conflicts in CFM. However, in practice, the role of the municipality is often limited to validation without serious examination of the existence and the functioning of the VOI. It also has a limited margin of maneuver due to lack of means and authority.
VOI	4.5	It is the main beneficiary of CFM and satisfying its interests constitutes a priority to ensure a sustainable management of forest resources.	1.5	They have very limited power to influence the process of CFM, especially at the design level. Generally, contributions are limited to simple consultations.
Fokonolona	4	The importance of the <i>fokonolona</i> depends on the approach: Assumed as one entity with the VOI in the territorial approach, and taken separately from VOI in the associative approach.	2.5	Although the <i>fokonolona</i> is not directly involved in the decision-making process, it is able to block the process by various means, founded in its legitimacy. Its interests are sometimes contradictory to those of VOI.
Customary authorities	2	Their involvement in CFM is far from being systematic and depends on the ideology of the support organization and the willingness of the VOI to include them. They play a very important role in the management of conflicts	1	They do not have the ability to influence the CFM process; however they generally hold the decision power in villages and are authoritative in the management of conflicts.
Migrants	3	They can be major players in terms of deforestation, degradation, or conservation.	1	They have no influence on the process of design and implementation of CFM.
Forest Administration	4	CFM is a state policy. The implementation strategy aims at meeting the sustainable management and conservation of forest resources, set by the State.	4	Because of its sovereign prerogatives. The State theoretically lies at the center of decision-making and plays a very important role in terms of regulation and supervision. However, the weakness of its human, technical and financial resources hampers the effective exercise of these functions. The State does not have sufficient capacity to influence the partners at different scales in the CFM implementation.
Law enforcement, and justice authorities	1	Relay of the executive committee of the <i>dina</i> and the forest administration, they play an important role of support to the VOI during the implementation of CFM, especially with regard to non-VOI members.	4.5	They do not really influence the CFM process, especially because few of the CFM <i>dina</i> , are in reality homologated, mainly because of the existence of transaction in forestry and because they are rarely mobilized for CFM.
Private sector operators	1.5	Sustainable valorization of forest resources is important in CFM. Economic operators can play an important role in the development of management plans and their financial support can influence the implementation of CFM. Taxes related to their activities can contribute to the effective redistribution of forest revenues.	2.5	They are not invited to participate in CFM decision-making process, but they can influence the VOI with their substantial financial flows, especially in the implementation of their economic activities.
Support agencies	4.5	They are actively involved in the design of CFM, They collaborate with the State in the design of projects and (temporarily) supervise CFM implementation. But they are not the direct targets of CFM.	3	They have substantial means. They have strong lobbying at the State and donors level. They support the State in obtaining funding. They define the approaches to develop for achieving the policy's defined visions.
Donors	2	Without their support, the implementation of CFM is hardly possible. However, their role related to CFM is not explicitly mentioned in the laws and regulations.	3	Donors have financing power that allows them to influence political decisions. They establish certain conditionality that determine the obtaining of financing support.
Research institutions	1	They can contribute to the training of actors and accompany them in the decision-making process	1	Research institutions and academia are neither important nor influential given the lack of program on the subject.

and academia	by producing knowledge and providing other stakeholders information and innovative techniques. Training and research in CFM, is however at this point ambitious.	
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APPENDIX K. MAP OF THE MANAGEMENT TRANSFERS IDENTIFIED IN MADAGASCAR



APPENDIX L. ELEMENTS OF NATURAL RESOURCES MANAGEMENT TRANSFER TO PUT IN RELATION WITH SECTORAL TEXTS

Law No. 96-025 of September 30, 1996 regarding the local management of renewable natural resources (JORM No. 2939 of October 14, 1996, p. 2377)		
Articles	Scope	Observations
2	Transferable resources are those within the scope of the State or territorial decentralized authorities	<u>Missing implementing texts:</u> texts defining the State and the decentralized communities private property Neither the State nor the decentralized communities' private properties have been subject to delimitation. Law No. 2008-014 on the private State property requires such a registration. There is a land insecurity regarding these source and areas of conflict and disputes between basic local communities and individuals.
3	VOIs operate as a NGO.	To rephrase because in practice the basic local communities all work as an organization. They have points in common with NGOs: they are non-profit oriented and satisfy a general interest mission. The NGO structure is not suitable for basic local communities since many obligations are attached to NGOs: provision of mandatory organs, making reports and detailed plan of activities, etc.
4	The benefits of the transfer management are recognized in the VOI having received the approval of the competent administrative authority. This competence is determined by the applicable laws and regulations according to membership category and considered resources.	<u>Missing implementing text:</u> text on cross-sectoral resources. The jurisdiction for cross-sectoral resources has not been defined by the law. This is for instance the case of mangroves that can also be handled by the Ministry in charge of fisheries.
7	The rights and obligations between the municipality, the State or the owning community, and the VOI are subject to a contractual agreement.	The obligation to inform must be mentioned in the law to allow municipalities to inform the responsible administration in case of infringements by the VOI. That way, this obligation will not be subject to any agreement.
9	The resources that may be subject to a management transfer are established in a list. The conditions to establish this list are determined by regulation.	<u>Missing implementing text:</u> list of transferable resources Regulatory texts have not been edited
10	The content of the management transfer request sent to the municipality is to be determined by regulation.	<u>Missing implementing text:</u> Content of the request of Management transfer to the municipality. The enactment of this text can help to standardize the management transfer application procedure. It also allows more transparency and leaves less room for the administration to determine the content of the request in a guide with no binding legal value.
14	Applications receiving a favorable decision from the municipality council will be subject to presentation in the form of a common request.	<u>Missing implementing text:</u> the decree supposed to define the content of the common request has not yet been enacted.
54	Benefits for the marketing and valorization of natural resources will be granted to VOIs with a license. These advantages granted	<u>Texts not enacted regarding the so-called advantages:</u> The law supposed to define the main principles. The

	to approving basic local communities, on the basis of certificates of origin of resources or derived products, will essentially be economic advantages using parafiscal tools.	regulations adopted to implement this law.
Decree No. 98-610 of August 13, 1998 regulating the modalities of the implementation of land tenure security (JORM No. 2545 of November 30, 1998, p. 3379)		
Main observation: Articles 13 and 14 of the Decree are inconsistent with Articles 36 to 38 of Decree 2001-122. This decree is not often applied in the context of management transfers while it allows the implementation of land tenure security for plots of land transferred to the VOI		
13	Disputes over land security with the community are subject to arbitration by the mayor of the affiliated municipality. This arbitration is possible only if conciliation efforts were initially conducted.	The procedure established by Decree No 2001-122 is different. First, the conciliation and arbitration is conducted by the Chairman of the municipality's council pursuant to sections 36 to 38. Then the 2001-122 decree states that the use of conciliation and arbitration are optional. However, it should list the cases of land tenure security disputes compulsory to conciliation and arbitration if the first round does not lead to success. Finally, the authority responsible to proceed to the conciliation and arbitration shall be specified by the texts: the Mayor or the Chairman of the Municipality Council.
14	It is possible to directly lodge appeals to competent administrative authorities. No appeal may be lodged before the municipality's mayor proceeds to his arbitration of the disputed parcel.	
Decree No. 2001-122 of February 14, 2001 fixing the conditions of implementation of contracts to manage forests belonging to the State (not published in the JORM)		
Main observation: The text has not been published in the Official Journal. Legally, under the provisions of Ordinance No. 62-041 (Article 6 in particular), the text has no binding value. Its publication in the Official Journal is therefore desirable.		
1 and 2	The text fits both in the context of the application of Article 24 of Law No 97-017 and under GELOSE	Uncertainty in regards to the objectives of the decree. If part of GELOSE, the provisions regarding the environmental mediators are non-existent (Article 18 of Law No 96-025 states that the presence of an environmental mediator is required during the first year of management transfer). The text does not insist on the accountability of the affiliated municipality regarding the transfer.
4	"Timber of first and second category, mentioned in the table annexed to the decree of November 17, 1930, are subject to special technical clauses as part of their valorization (management plan, operating agreement, <i>dina</i> ...) ". The article also allows the possibility to proceed gradually to the management transfer.	This decree from 1930 was not mentioned in the visa of Decree No. 2001-122. Moreover, in principle, the decree of 1930 should have been repealed by Decree No. 98-782. As a matter of fact, the first year of management transfer is used to transfer the establishment of the management plan, to identify and train members in the VOI that have been observed. The transfer is effective as a whole in the second year following the signature of the contract. A modification of actual texts with the objective to include this practice could be considered.
5	The CFM is applicable to the controlled zone of occupation, the controlled use area and to peripheral zones of protected areas.	Nothing in the new code of protected areas does specify this option. However, the CFM decree should comply with this code which is a law.
11	Contract management of forests is carried out by agreed management team. However, subcontracting may be allowed in favor of approved forestry professionals.	Provision contradicts with certain provisions of Decree No. 98-782 regarding the forestry regime. Article 32 states that in the case of a management contract, provisions on the terms of the exploitation agreement are applicable (if we consider that the GCF is a decree implementing Law No. 97-017 text). This provision

		prohibits any transfer agreement in Article 28. Article 3 prohibits subcontracting. However, Article 31 of the decree tacitly authorizes subcontracting. GCF Decree should be recognized as a specialized text and therefore, provisions of Article 11 should prevail upon publication of the text.
30	Allows chairmen of VOIs executive committees to seize criminal products	This provision contradicts the provisions of Article 2 and 13 of Ordinance No. 60-128 fixing the procedure for penalizing infringements of the forest legislation. These provisions state that only staff members of the forest service and other state officials are empowered to seize and sequester products, plants or animals subject to the infringement. According to the provisions of Article 15 of the Ordinance of 1960, only the role of sequestering agent can be attributed to the customary rural community.
36	The President of the municipality can be requested by the members of the VOI to resolve disputes between members if the dispute resolution procedure provided by the <i>dina</i> has not been respected. The Chairman of the affiliated municipality proceed amicably to the reconciliation of the parties.	Harmonize provisions with Articles 13 and 14 of Decree 98-610 which advocate for an obligation for the mayor of the municipality to conduct conciliation or arbitration in case of disputes relating to land tenure with the VOI (see above).
37 and 38	In case of troubles due to a third party claiming its rights within the VOI, the chairman of the municipality council may conduct conciliation. The dispute may be settled by arbitration if the parties consent.	
Decree No. 2000-027 of January 13, 2000 on communities responsible for the local management of renewable natural resources (JORM No. 2627 of February 14, 2000, p.1435)		
4	The VOI must be registered with the affiliated municipality. The declaration of existence must be accompanied by a status of the VOI and the minutes of incorporation. The declaration of existence is a condition of admissibility to the management transfer.	The statement should not be accompanied by a status. The text does not mention the role the <i>fokontany</i> plays in regards to the procedure, for example when it comes to the membership authentication of the future VOI with the locality.
5	Any resident living within the local VOI can be accepted as a member.	Ideally, the VOI should also include as members individual residing outside the territory but with the condition for the member to successfully participate to activities within its means. These members can serve as relays between VOI and the outside world (search for partners or buyers if the VOI performs the valuation of renewable natural resources for example).
20	VOI resources come from members' contributions, material and financial support from other organizations, donations and income from activities.	The legal regime of donation, financial and material support is not specified for VOI especially regarding their taxation. As for the products of activities, if an environmental mediator did not intervene at the request of the VOI to establish a management system, their allocation and management has often been the source of conflict especially for basic local communities making valuation.
Decree No. 2000-028 of February 14, 2000 regarding the environmental mediators (JORM No. 2627 of February 14, 2000, p.1441)		
Main observation: Over the past few years, management transfers occurred without the presence of an environmental mediator. This presence should be mandatory for the first contract approval request (Article 18 of Law No. 96-025).		
The presence of the mediator is important since he remains neutral in relation to parties (members of the VOI, affiliated municipality		

and forest administration).		
Contracts concluded under the GCF decree have the characteristic that the mediator role was played by a facilitator hired by the promoter. The facilitator is not neutral with regards to the parties because its terms of reference are set by the developer.		
One of the main reasons why environmental mediation was dropped is the remuneration of environmental mediators as basic local communities could not support their salaries due to their limited financial resources.		
A reintroduction of mediators in environmental management transfers is necessary. In addition, the environmental mediator can also assist local communities in the creation of a management system and ensure training on regulation of access to resources, conditions on how to sell over-the-counter or auction rights on products resulting from the use of renewable resources, income distribution modes for incomes generated by the valorization of resources, the allocation of profits or penalties.		
10	A list of environmental mediators is established by the Minister for the Environment	<p><u>Text to update : list of environmental mediators</u></p> <p>The list of environmental mediators must be updated by the State, in order to reintroduce them into the process of implementation of management contracts and management transfers and avoid promoters to take control.</p>

Law No. 90-033 of December 21, 1990 on the Malagasy Environment Charter (JORM No. 2035 of 24 December 1990, p. 2540) as amended by Act No. 97-012 of June 6, 1997 (JORM of June 9, 1997, p. 1171, special Edition and No. 2584 of 12 July 1999, p. 1479)		
Articles	Scope	Observations
Ordinance No. 60-128 of October 3, 1960 establishing the procedure for penalizing infringements to the forest legislation, hunting, fishing and the protection of nature (JORM of October, 15 1960, p. 2072) amended by Ordinance No. 83-010 of March 5, 1983)		
Main observation: the text was issued in the 60s. It sets out the main principles for sanction procedures with regards to forest infringements. This text effectiveness is questionable due the anarchy, abuses and corruption in the forest sector. Updating of the provisions of this Ordinance in relation to the current context is necessary.		
4 to 10	Provisions on the finding minutes prepared by forest officers and other authorized officials.	The provisions do not allow to assess the credibility of minutes' findings and their content appreciation is left to the arbitrary determination of the agent. The initiative to take public action can only be taken by the forest administration which does not necessarily guarantee the transparency and effectiveness of prosecution.
13 to 20	Set out the principles for seizure and confiscation of forest products.	The used terms of seizure, confiscation and sequestration should be specified as they are confusing. The release of the seized objects that may be ordered by the presiding judge on the applicant's request does not mention the reason that can justify it. The opportunity for the offender to use the transaction to receive a restitution of the seized or confiscated products is a potential source of corruption.
40 to 43	Enumeration of principles applicable to transactions.	No distinction is made regarding offenses that may be subject to transactions. Yet crimes do prevent for transactions to happen. (The COAP does not allow for example any transaction in the case of crimes). The fate of seized or confiscated products is not clearly explained after the occurrence of the transaction. They should not be returned to the offender because they were illegally extracted.
Law No. 97-017 of August 08, 1997 revising forest legislation (JORM No. 2449 of 25 August 1997, p. 1717)		
1	The list of forest products will be listed in a decree.	<u>Missing implementing text</u> : Decree regarding the list of

		<p>forest products</p> <p>This list would have enabled to differentiate forest products from agricultural products present in the forest. It is also a major issue to define the resources that could be subject to a management transfer to basic local communities (Act No. 96-025).</p>
21	Forests belonging to the State, regional and local authorities and public institutions will be legally subject to the forest system.	The delimitation of forests is nonexistent which contributes to major land insecurity.
23	A national forest master plan elaborated in a participatory manner will help to guide the forest policy and the management of State forests.	<p><u>Missing implementing text</u>: decree on a National Forest master plan</p> <p>The plan will have to be updated as often as possible to improve the management of State forests and to better assess the achievement of management transfers.</p>
24	The State may delegate the management of its forests to private persons. A decree will set the modalities to proceed to delegation.	Article 1 of GCF Decree stipulates that it is taken into consideration by section 24 of Act No. 97-017. But with the appearance of Decree No. 2013-785 on the delegation of management of state forests, article 1 of GCF decree was questioned. The only management transfer modality that currently exists is the one provided by GELOSE.
35	An inventory of all State forests will take place two years after the publication of Law No. 97-017	<p><u>Missing implementing text</u>: inventory of State forests</p> <p>The inventory has not yet occurred. This situation generates some uncertainty as to the entity owning different forests. However, only State forests and forests belonging to local authorities can be subject to a management transfer. This land insecurity creates a high risk.</p>
37	Regional and local authorities are entitled to administrate levies and discounts with rates and collection mode set by the law on regional and local authorities.	Many abuses have been observed in practice. The discounts were applied without any legal basis and without complying with the provisions of the law on regional and local authorities. Local officials must respect the law and know the legal procedure for instituting rebates and levies. The VOI will support them if they value forest resources.
52	The national forest fund is a privatized managed fund. Its management method is to be fixed by regulation.	<p><u>Missing implementing text</u>: Decree on the national forest fund</p> <p>The promulgation of this text is a major issue in regards to transparency of the administration on the use of forest fund especially for the fact that royalties from logging feed this fund.</p>
53	Resumption of Article 37 of Law No. 97-017. However, the last paragraph adds that for municipalities, the rebate rates are set by decision of the deliberative assembly.	The last paragraph is no longer relevant following the new texts on decentralization. Municipalities should always refer to these texts to fix rebates.
56	Commitment of the State to implement provisions of this Act within one year of publication.	The State has failed to its commitments since most implementing regulations were never enacted.
Decree No. 98-782 of September 15, 1998 regarding the forestry plan (JORM No. 2600 of September 27, 1999, p.2207)		
4	Any applicant must justify of his qualifications, training, titles or diplomas or demonstrate sufficient prior experience in this activity, or be assisted by a person with the required competences. The minister in charge of forests by decree enacts the list of these required qualifications, degrees or diplomas.	For the VOI, it is necessary that the text specifies that they have received the required training. In practice, the members still receive training granted by the forest administration. <u>Missing Implementing text</u> : Decree listing the required titles, programs and degrees especially trainings for the VOI.

6	Owners of public forests will implement management plans as soon as possible for their forests. They must be approved by the Minister responsible for forests after advice from the Forest Commission.	Management plans have never been adopted. Their implementation is still left to the responsibility of the forest exploitation and therefore to the VOI wishing to benefit from a management transfer. Establishing these plans in advance could have lower costs for the achievement of management transfers.
9	Within five years from the publication of Decree No. 98-782, any operation will be submitted to the management plan.	Provision not applied so far.
10	Any exploitation complies with the requirements of MECIE decree. The exploitation of mangrove forests and estuaries will be subject to specific conditions established by regulation.	The MECIE decree does not provide any special provisions for exploitation such as an impact study for example. However, this can be especially useful for the establishment of a management transfer. A text has recently been created by the Ministry to that matter but it only concerns the commission to mangrove management.
11	In the context of the implementation of the forest policy, all affected populations, NGOs and professional organizations are consulted and involved by the forest administration officials	VOIs should be consulted along with these entities to improve forest management.
37	The control and the monitoring of forests exploitation are conducted by the authorized forestry agents following the terms set by the Minister of Forests.	<u>Missing implementing text:</u> the decree establishing the rules for forest control. This decree is supposed to specify the model of counterfoil book that every forester should possess (Article 38 of the Decree) that was virtually defined by a guide: the manual of forest control which should have no binding legal force.
39	The labeling modalities of exploited resources are to be determined by a decree of the Minister of Forests	<u>Missing implementing text:</u> Decree fixing the labeling of forest products. The transportation of forest products can only be done by affixing regulatory markings/labels (Article 40 of the Decree). How will VOIs proceed to do so? Will the products traceability be insured?
44	Raw and processed forest products are subject to classification as well as dimensional and qualitative standardization.	<u>Missing implementing text:</u> The text on the classification and dimensional standardization of forest accessory products has not been enacted. This classification is sometimes done summarily by the decrees setting the royalty rates of forest products, however, it changes every year and the presence of classifications in these texts is not mandatory.
49	Profits from payment of royalties will be transferred to the forestry funds following conditions fixed by regulation.	<u>Missing implementing text:</u> The terms of use of forest funds and their management. There is a regional forest fund. Their use for a contribution to transfers or any other operation should be considered as an option.
Order No. 2915/87 of September 02, 1987 on the exploitation of forest accessory products (JORM No? Of September 7, 1987, p.2092-2098)		
<u>Main observation:</u> order should have been repealed with the adoption of Decree No. 98-782. A more recent text should have been enacted to ensure compliance with the provisions of Decree No. 98-782. In practice, the operating agreements made under this decree		

mention a decree already repealed in 1930 that has no legal force. If local communities can participate to the valuation of forest accessory products, it is necessary to adapt the provisions of the order.		
3	The collect of medicinal and industrial forest plants can be allowed without an exploitation permit	Disposition to update in accordance with Article 4 of Decree 98-782.
5	Paragraph 6: decentralized authorities benefit from a statutory levy of 3% on the marketing of products covered by the decree.	Provision repealed by the decentralization laws establishing rebates and levies for the benefit of regional and local authorities.
8	The transport of plants is accompanied by a permit stamped by the representative of the decentralized community at the departure point.	It should be noted that in this case, the community is the municipality from which the resource is extracted.
12	Paragraph 3: obligation for farmers and private producers to participate in safeguarding work and improvement of these plants according to conditions to be defined by the minister responsible for the forest administration. Possibility for the forest service to ask the competent authorities to specify the opening periods for exploitation of forest medicinal and industrial plants.	<u>Missing implementing text</u> : Decree on conditions applying to safeguarding work for the improvement of plants affected by the decree
	Paragraph 4: Upon argued request from the water and forestry services, local administrative authorities may by order suspend the exploitation of forest medicinal and industrial plants.	Need precision on what the text means by local administrative authority: <i>fokontany</i> , municipality or district. The article should also specify the scope of the measure to assess the territorial limitation and the binding force of the order.
Order No. 6686/2000 of July 04, 2000 which regulates the exploitation and the marketing of forest accessory products (JORM No. 2649 of July 17, 2000, p.2306).		
4	The Minister for Water and Forests reserves the right to introduce quotas or prohibit the raw exploitation of forest accessory products as long as the sustainable production capacity of forests is not assured.	It is necessary for this article to specify that section 4 of Order No. 2915/87 is establishing the conditions under which the exploitation of accessory products could be suspended and the consequences of the suspension.
Law No. 2001-005 of February 21, 2001 on the code on management of protected areas (JORM No. 2829 of 7 April 2003, p. 1180)		
11	Objectives of a protected area, conservation, research, valorization of the natural and cultural heritage, education and recreation of the citizens, promoting ecotourism and contribution to sustainable development.	The text does not mention the possibility of management transfer in PAs.
15	In the case of the creation of a new protected area, the agency responsible for the management of protected areas is involved at the different stages of their creation as a coordinator and facilitator. The Ministry of Environment ensures the participation of CTDs and autonomous provinces as well as the participation of other ministries	The text does not explicitly consider the participation VOIs. These can however be affected by the creation of a protected area. The Forestry Commission (expected by Decree 2005-849) should also participate in the creation of PAs.
31	A possibility of delegating management operational activities is open to the managing body of a protected area	VOIs should be taken into account in this case. They could carry out certain operations relating to patrolling on protected areas plots especially if they are devoted to conservation.
34	The organization responsible for the management of the PA is allowed to contract agreements in the context of the development of the PA without going against the objectives of protection and conservation.	The provision should be favorable to the participation of VOI. The valorization of PFNL cannot go against the objectives of protection and conservation. But in this case, the conclusion of a management transfer contract is subject to the agreement of the PA manager.
44 and	Present the regime of recognition and punishment of	The text is in contradiction with the provisions of Ordinance

following	crimes within the PAs.	<p>60-128. While the order qualifies certain violations as infractions, the COAP qualifies them as crime which can hinder the judge in the classification of the offense and in the choice of the applicable penalty.</p> <p>The possibility of transaction is open to all types of offense in Ordinance 60-128. In the COAP, the transaction is not possible for qualified crime offenses. Moreover, according to the COAP, the transaction can only happen before judgment while in Ordinance 60-128 it can happen after the judgment. A logical articulation must be found between these texts and the revision of the Ordinance 60-128, in line with repressive laws, is more than necessary.</p>
Decree 2005-849 of December 13, 2005 revising the terms and conditions of application of Law No. 97-017 revising the forest legislation (JORM No. 3024 of April 17, 2006, p.2099)		
<p>Main observation: this text anticipated the existence of a forestry commission within the Regional Environmental Districts, a forestry committee having a deliberative legal competence in Articles 5 and 17 of the Forest Act (recognition of the forest nature of a parcel and diversion of the forestry regime) and an advisory competence under Articles 16 and 22 of the Act (CTDs and State submission to the forest system, and private forests submission to the forestry plan). The commission accepts among its members' stakeholders in the forestry sector (Article 6 of the Decree), a representative from legally constituted local communities. The problem is that these forestry commissions have never worked.</p>		
2013-785 Decree of August 29, 2013 regarding the procedure for delegating the management of state forests to public or private persons (JORM No. 3561 of June 23, 2014, p.1827)		
53	A decree will set the forms of valorization and the percentage of revenue transferred into the Forest Fund account for the valuation undertaken by the site delegate.	<u>Missing implementing text:</u> implementing decree fixing the forms of valuation and percentages.
Law No. 2014-018 of September 12, 2014 regarding the competence, the modalities of organization and operation of decentralized territorial authorities, as well as those of the management of their own affairs (JORM No. 3578 of October 3, 2014, p. 3690)		
15	The implementation of CTDs competences and attributions is done in a participatory manner and with full transparency. A consultation structure will be established by the CTD in this framework. The terms of this article shall be set by regulation.	<u>Text to enact:</u> Decree on the modalities of the structure of consultation and the participatory and transparent implementation of CTDs competences. This is a great opportunity to affirm the role of local democracy in the management of CTD businesses especially for municipalities. The consultation structures will enable locals to address issues related to forests but also to take adequate measures. It is also an opportunity to strengthen the control on management transfers in municipalities where they exist.
21	Partnerships between CTDs and the private sector must be subject to an agreement approved by decision of the council of the concerned community. The resources and expenditures of the partnership are required to be recorded in the budget of the concerned CTD. The terms of the agreement should be set by regulation.	<u>Text to enact:</u> terms of agreement between CTDs and the private sector. The enactment of this text appears as an opportunity for CTDs especially municipalities depending heavily on partnerships with the private sector. Registration of resources and expenditures in the local budget in the context of a partnership provides greater transparency. The approval by the Council allows better control of the partnership. The accuracy of these various modalities will also strengthen the role of municipalities in the framework of management transfers which are often "funded" by the private sector.
33	The competences of municipalities, regions and provinces are listed in Articles 26-32 of the law. Regulatory instruments will set the conditions for implementation of responsibilities listed under Articles 26 to 32.	<u>Text to enact:</u> text detailing the conditions of implementation of CTDs. This is an opportunity to define the conditions of implementation of competences regarding CTDs forest

		management: their preservation modalities, their protection...
Law No. 2015-005 recasting the code on protected areas (JORM No. 3610 of March 23, 2015, p.1337)		
<u>Main Observation:</u> text still being promulgated and published. The text does not mention management transfers to local communities. However, texts on management transfers namely Decree 2001-122 GCF mentions the possibility of management transfers in peripheral and buffer zones of protected areas including 5 and 6 categories (Article 5).		
19 and 20	Protected areas of category 5 (protected harmonious landscapes) aim at promoting sustainable lifestyles and economic activities in harmony with the nature and the preservation of the identity and interests of local communities.	Implicitly, the provisions do not take into account the possibility of management transfers in the peripheral zone, the controlled zone of occupation and the controlled area listed in Article 5 of Decree 2001-122 GCF. We can observe a setback in regards to the implementation of the management transfer policy especially in the case of protected areas. Furthermore, if management transfers are not possible, the protected area manager has the capacity to define by contract the ability of local communities to exploit renewable natural resources.
28	The process of creation of a protected area is fixed by regulation.	<u>Text to enact:</u> decree on the creation process of protected areas. Normally, the classification of the final protected areas for 2015 should not be possible without the enactment of the decree. Yet many new protected areas have been established as final protected areas violating Article 28 of the protected area code.
33	The modalities to modify a protected area status are to be fixed by regulation.	<u>Text to enact:</u> Decree regarding the modalities to modify a protected area status.
36 and 46 last paragraph	The management transfer contract includes a requirements specification defining the rights and obligations of each party. Its consistency will be specified by regulation.	<u>Text to enact :</u> content of the requirements specification and modalities of implementation
38	An advisory body assists the Ministry in charge of protected areas to define the main guidelines for the management and coordination of the system of protected areas in Madagascar. The composition and attributions of the advisory body are to be fixed by regulation.	<u>Text to enact :</u> composition and attributions of the advisory body
40 paragraphs 2 and 3 then article 82	In order to comply with the cohabitation principle specified in the code on protected areas, it will be possible to perform mining activities in protected areas of category 5: protected harmonious landscapes. The operation can only be done through a zoning of the protected area. The compensation modalities have to be defined by regulation.	<u>Text to enact :</u> decree on compensation modalities in regards to mining exploitation Mining possibilities in protected areas is likely to increase anthropic pressure on the environment so that part of the forest is destroyed. Experience has also shown that it is particularly difficult to manage the impacts of a mining operation within a protected area. It would therefore be appropriate to clearly define the rules for the supervision of mining operations or even ban it within protected areas.
49	The Community Management Agreement defines communities' economic, cultural and religious activities as well as the modalities of intervention to manage the protected area.	The Community Management Agreement remains the exclusive mean by which communities participate in the management of the protected area and establish their economic, religious and cultural rights. The community forest management model within each protected area will therefore vary according to the choices proposed by the Manager. The code on protected areas implicitly excludes management transfers within protected areas and around their peripheral areas. For efficiency purposes, these

	The safeguard measures listed in the Community Management Agreement will be subject to an assessment of their effectiveness after five years and modified if necessary.	measures should be evaluated each year.
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Other observations: Although the code on protected areas lists the principles of transparency and accountability of the manager of the protected area, the text does not specify the rules relating to this. This is for example the case when producing reports accessible to all age groups including the participation of local communities in and around the protected area in order to optimize management. The text does not describe penalties applicable in case of mismanagement by the manager. Nothing in the text does grant a right of opposition to local communities in the context of the creation of a protected area. Their prior consent before the creation of the protected area is not taken into account.

APPENDIX M. GUIDELINES AND FRAMEWORK TO MONITOR CFM

Community management can take different forms depending on each case, even if established by standards applying everywhere.

According to the criteria of assessment of community forest management limits and success described in the international bibliography, the following questions can help to monitor effectively CFM operations.

How important are CFM resources to the community?

- *Areas under CFM control:* the surface of land managed in through decentralized approach by local communities is very important. CFM is relevant only when applying to large areas so to bring benefits to a greater number of locals.
CFM of degraded soils is not beneficial to communities as the communities inherit from all the disadvantages of the land without any advantages. When the surface of a CFM is too small, the community management only benefits to a few individuals at the expense and to the exclusion of other members of the local community. To be effective, the surface indicator should be reported to the number of potential beneficiaries.
- *Types and forest wealth of CFM classified forests:* forest resources must also be estimated in terms of quality. What matters to local communities is indeed to manage resources with the aim to generate incomes beneficial to locals. Various wood production capacities as well as non-timber forest products should be relevant in the eyes of local communities. The composition of natural areas by types (natural forests, plantations, agroforestry, other types of land use and occupation) as well as the updated inventory of resources if existing, provide a potential indicator of wealth.

Who benefits from CFM?

- *Number of beneficiaries of CFM:* number of people, families or small groups who might benefit of CFM. The value of community management is to contribute to the resolution of local problems of food security and access to land. As the number of potential beneficiaries, the higher the interest of going to CFM diet is important.
- *Nature of CFM beneficiaries:* the objective is to know who the local actors benefiting the most from CFM are. In some cases, restricted social and ethnic groups monopolize CFM products, excluding others. Particular attention should be paid to the inclusion of the poorest or most vulnerable. CFM is even more beneficial to the community when it includes numerous actors coming from diverse socio-economic backgrounds.

What is the level of ownership and "empowerment" of local actors?

- *Effective participation of members in the CFM:* it is assessed by the number of meetings per year, the number of participants attending those meetings, and the number of initiatives involving members of the group.
- *Contribution of members to the decisions:* the quality of this participation, warrant of good governance, implies that opinions should be expressed by participants and taken into account when making decisions. The average percentage of participants in meetings may provide a first indication.
- *Responsibilities transferred to the community:* CFM can lead local actors to take on new responsibilities, which are usually included in the CFM contract: making of the resources management plan, lead the inventory of resources, directly harness or outsource the harnessing of resources (fuelwood, timber, non-timber forest products, pasture), participate in ecotourism activities, etc. A comprehensive community empowerment can lead the community to pay taxes to the State for the conduct of these operations.
- *Redefining the role of the administration:* the decentralization implies that officials in support of community management structures intervene only upon request from the group and only to provide technical advice without any veto power, and without the will to interfere in the discussions related to the decision itself. They can only be present after invitation from the group.

What is the political and social context of CFM?

- *Formalizing management objectives*: the operating rules established in the community management contract, binding local communities, the government and its representatives (being either the local territorial administration or the central forest administration) set clear targets for the CFM. These objectives, and therefore the corresponding expected results, need to be clarified and accepted by local actors.
- *Status of land under CFM*: the legal status of land under CFM is important. This management regime, established to promote the sustainability of resources, must guarantee the maintenance of long-term resources. In some cases, CFM can lead to status modifications that can be both favorable and unfavorable. Some mechanisms of land appropriation that are beneficial to actors or small groups may also occur as a result. The access to land may in some cases be as important as the access to resources.
- *Legal personality*: If the community is recognized by the law and has a special status that keeps it safe from encroachments. Sometimes the community is recognized by a single regulatory text, which can cause problems in the case of conflicts arbitrated according to external laws. The community can be recognized in general (this is especially the case when a decentralization law organizing the decentralization of public authority does exist) or in a specific way in regards to the conservation of natural areas (but in this case, the community's scope of intervention is limited and management bodies, when they are different, may compete or conflict with local policies).
- *Financial liability*: when the community is self-supporting, the community supports CFM economic risks and investments but also perceives its management benefits. This situation makes sense when valuable resources do exist. Financial management should be transparent, align with national accounting rules, subject to approval / validation by the community management bodies and by the public authority when it is formally stated in the CFM contract.

What are CFM operating rules?

- *Status of management bodies*: the rules governing the formation and the operations of the various CFM committees must be clarified, published and understood by members of the community to enable them to resolve potential conflicts.
- *Mechanisms of negotiation and conflict resolution*: an internal regulation system officially accepted and amendable should help to manage daily problems. The regulation system establishes rules, stating how personal opinions may be taken into account (negotiation methods) and how to resolve potential conflicts.

What were the initial results of the CFM?

- *Changes in the nature of resources*: the development of new standards and norms of management is expected to have an impact on resources sustainability. The transfer of management to groups of local actors is expected to lead to a better conservation of resources. However, it could have the opposite effect if groups submitted to strong constraints decide to pursue immediate interests. This is why it is important to verify as soon as possible if the CFM is beneficial to the sustainability of long-term resources. For that matter, the main common sustainable management indicators can be used (e.g. surface variations, timber density and volume variations, total biomass, the importance of regeneration, changes in species diversity to assess the effect on biodiversity, erosion control, water quality, soil fertility, etc.).
- *Changes in the level of ownership by the local community*: CFM gives local actors new rights and new responsibilities. More difficult to assess (as it is prone to subjective assessments), the group members feeling of

ownership is of paramount importance in assessing the interest of the community for the community management of forest resources.

- *Modification of profits extracted from the valorization of resources:* in a traditional system of natural resources management, goods and services also benefit to agents external from group, often before benefiting to the group itself. In the case of CFM, empowerment of local actors should benefit them economically unless the nature of the resources at the moment of the transfer does not generate profits beneficial to the community. Assuming it is possible to identify CFM as an income generating factor, it is of prime importance to track the evolution of revenues generated by natural resources for local actors under the CFM.
- *Changes in terms of social equity:* Did the CFM allow a more equitable distribution of goods and services extracted from local natural resources (for example by allowing a greater number of local actors as beneficiaries), or did it give more weight to already dominant actors.
- *Changes in regards to food security:* finally, the CFM if well conducted should improve food security for the group, allowing optimal use of local resources (e.g. by providing additional income and forest non-timber products between harvests, or by the direct provision of food derived from resources management).

APPENDIX N. REFERENCES OF LEGAL TEXTS CONSULTED

Constitution

- Malagasy Constitution of the Fourth Republic of December 11, 2010 (Unavailable JORM [Official Journal of the Republic of Madagascar] References).

Orders

- Ordinance No. 62-123 of October 1, 1962 on the classification of areas for forestry, pastoral or agricultural land in Madagascar (JORM of October 26, 1962, p. 2510).
- Ordinance No. 62-123 of October 1, 1962 on the classification of areas for forestry, pastoral or agricultural land in Madagascar (JORM of October 26, 1962, p. 2510).
- Ordinance No. 62-041 on the provisions of domestic law and private international law (JORM No. 244 of September 28, 1962, p. 1989) supplemented by Act No. 98-019 of December 2, 1998 (No 2549 JORM of December 15, 1998, p. 3642 and 3654; Errata. JORM No. 2571 of April 26, 1999).
- Ordinance No. 60-133 of October 3, 1960 on the general rules governing associations (JORM No. 127 of October 15, 1960, p. 2090) as amended by Ordinance No. 75-017 of August 13, 1975 (No 1076 of JORM August 23, 1975, p. 2254).
- Ordinance No. 60-128 of October 3, 1960 establishing the procedure for the enforcement, forestry legislation, hunting, fishing and the protection of nature (JORM of October 15, 1960, p. 2072) amended by Ordinance No. 83-010 of March 5, 1983 (JORM April 2, 1983, p. 803).
- Ordinance No. 60-127 of September 3, 1960 amended and subsequent texts on the system of forest clearings and vegetation fires (JORM of October 1960, p. 2069.), Section 25 repealed and replaced by Ordinance No. 72 -039 of October 30, 1972 (JORM of December 2, 1972, p. 3212), amended by Ordinance No. 75-028 of October 22, 1975 (JORM of November 23, 1975, p. 2795).

Laws

- Act No. 2015-005 recasting the Protected Areas Management Code of January 22, 2015, repealing Act No. 2001-005 of February 11, 2003 (JORM No. 3610 of March 23, 2015, p. 1337).
- Act No. 2015-003 of December 10, 2014 on the updated Malagasy Environmental Charter (Promulgated on February 19, 2015 but not published in JORM).
- Act No. 2014-020 of September 27, 2014 on the resources of the decentralized territorial authorities, terms of elections, and the organization, operational mode and functions of their organs (JORM No. 3578 of October 3, 2014, p. 3700).
- Act No. 2014-018 of September 12, 2014 on the competences, the modalities of organization and the operation of decentralized territorial authorities, as well as those of the management of their own affairs (JORM No. 3578 of October 3, 2014, p. 3690).
- Act No. 2008-014 of July 23, 2008 on private property of the State, the Decentralized Authorities and legal persons of public law (JORM No. 3218 of October 27, 2008, p. 7686).
- Act No. 2005-019 of October 17, 2005 establishing the principles governing the different status of land in Madagascar (JORM No. 3007 of January 2, 2006, p. 4).
- Act No. 2005-018 of October 17, 2005 on International Trade in Endangered Species of Wild Fauna and Flora (JORM No. 3123 of August 12, 2007, p. 4535).
- Act No. 2005-013 of February 11, 2005 organizing the implementation of Law No. 2001-005 of February 11, 2003 Protected Areas Management Code (JORM No. 2956 of February 11, 2003, p. 2236).
- Act No. 2001-004 of October 25, 2001 on the general regulation of Dina in public safety (JORM No. 2746 of November 19, 2001, p. 3047).
- Law No. 99-022 on the Mining Code (JORM No. 2595 of August 30, 1999, p 1978 and following.) As amended by Act No. 2005-001 of October 17, 2005 (JORM No. 3015 of February 20, 2005, pp. 1569-1597).
- Act No. 97-017 of August 8, 1997 revising forest legislation (JORM of No. 2449 of August 25, 1997, p. 1717).
- Act No. 96-030 of August 14, 1997 on the special system for NGOs in Madagascar (JORM No. 2463 of November 10, 1997, p. 2198).
- Act No. 96-025 of September 30, 1996 regarding the local management of renewable natural resources (JORM No. 2939 of October 14, 1996, p. 2377.).
- Law No. 90-033 of December 21, 1990 on the Malagasy Environment Charter (JORM of No. 2035 of December 24, 1990, 2540 p.) As amended by Act No. 97-012 of June 6, 1997 (JORM June 09, 1997, p. 1171, Special Edition and No. 2584 of July 12, 1999, p. 1479).

Decrees

- Decree No. 2013-785 of August 29, 2013 establishing the States' forest management methods for public or private persons (JORM No. 3561 of June 23, 2014, p. 1827).
- Decree No. 2006-910 regarding mining code of December 19, 2006 establishing the procedures for the application of Law No. 99022 of August 19, 1999, the Mining Code as amended by Law No 2005 021 of October 17, 2005 (JORM No. 3097 of 30 March 2007, pp. 2397-2489).
- Decree No. 2006-097 establishing rules for the application of the law on international trade in wild fauna and flora species (JORM No. 3123 of August 13, 2007, p. 4588).
- Decree No. 2005-849 recasting the general conditions for implementing Law No: 97-017 of August 8, 1997 revising forest legislation (JORM No. 3024 from April 17, 2006, p. 2099).
- Decree No. 2005-013 of January 11, 2005 organizing the implementation of Act No. 2001-005 regarding the protected areas management code (JORM No. 2956 of February 11, 2003, 2236 p.).

- Decree No. 2001-122 of February 14, 2001 fixing the implementation conditions of the contract-management of state forests (Non-published in JORM).
- Decree No. 2000-028 of February 14, 2000 regarding environmental mediators (JORM No. 2627 of February 14, 2000, p. 1441).
- Decree No. 2000-027 of January 13, 2000 on grassroots communities responsible for the local management of renewable natural resources (JORM No. 2627 of February 14, 2000, p. 1435).
- Decree No. 99-954 of December 15, 1999 on the compatibility of investments with the environment (MECIE) (JORM No. 2648 of July 10, 2000, 2235 p.).
- Decree No. 98-782 of September 15, 1998 regarding the forestry plan (JORM No. 2600 of September 27, 1999, p. 2207).
- Decree No. 98-610 of August 13, 1998 regulating the modalities of the implementation of the Rural Relative Land tenure, pursuant to Law No. 90-012 of June 6, 1997 amending and supplementing Law No. 90-033 of October 21, 1990 Environmental Charter (JORM No. 2545 of 30 November 1998, p. 3379).
- Decree No. 98-394 of May 28, 1998 on the definition of the mining sector policy in Madagascar (JORM No. 2512 of June 15, 1998, p. 1810).
- Decree No. 97-1200 of October 2, 1997 adopting the Malagasy forest policy (JORM No. 2467 December 01, 1997, p. 2324).

Orders

- Order No. 25608/2014 of August 8, 2014 on setting forest fees on commercial hunting license, permit collection and export of products of fauna and flora as well as their operation and samples for scientific purposes (Unpublished the JORM).
- Order No. 6830/2001 establishing detailed rules and procedures for public participation in environmental assessment (JORM No. 2722 of July 16, 2001, p. 1924).
- Order No. 6686/2000 of July 4, 2000 regulating the exploitation and marketing of forest products Accessories (JORM No. 2649 of July 17, 2000, p. 2306).
- Order No. 2915/87 of September 02, 1987 on the exploitation of forest products Accessories (JORM No. of September 7, 1987, p. 2092-2098).

Notes

- Ministry of Environment, Ecology and Forests No. 293/14 / MEEF / Mi of September 8, 2014 waiving suspension of operating permits issued by tendering procedure and cutting permits in management transfers.
- Ministry of Environment, Ecology and Forests No. 245-14 / MEEF / Mi of August 18 2014 suspending the operating permit issued by tendering procedure and cutting permits in management transfers.
- Ministry of Environment and Forestry No. 018/11 / MEF / SG / DGF / DVRN of September 21, 2011 suspending the cutting licenses or permits to operate within management transfers.
- Ministry of Environment, Water and Forests and Tourism No. 02/08 / MEEFT / SG / DGEEF / DVRN / SADG January 10, 2008 on the cancellation of all logging permit options for operations over the counter, authorization to operate within the framework of management transfers throughout the national territory.

APPENDIX O: DESIGN PRINCIPLES ILLUSTRATED BY LONG-ENDURING COMMON-POOL RESOURCE INSTITUTIONS (OSTROM 2000)

Elinor Ostrom's work to beyond the tragedy of the commons and ensure a long term common pool resources use identified the 8 following points to pay particular attention to:

1. Clearly Defined Boundaries

Individuals or households with rights to withdraw resource units from the common-pool resource and the boundaries of the common-pool resource itself are clearly defined.

2. Congruence

The distribution of benefits from appropriation rules is roughly proportionate to the costs imposed by provision rules. Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions.

3. Collective-Choice Arrangements

Most individuals affected by operational rules can participate in modifying operational rules.

4. Monitoring

Monitors, who actively audit common-pool resource conditions and appropriator behavior, are accountable to the appropriators and/or are the appropriators themselves.

5. Graduated Sanctions

Appropriators who violate operational rules are likely to receive graduated sanctions (de-pending on the seriousness and context of the offense) from other appropriators, from officials accountable to these appropriators, or from both.

6. Conflict-Resolution Mechanisms

Appropriators and their officials have rapid access to low-cost, local arenas to resolve conflict among appropriators or between appropriators and officials.

7. Minimal Recognition of Rights to Organize

The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

For common-pool resources that are part of larger systems:

8. Nested Enterprises

Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.