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Community Forestry Incentives and Challenges in Mozambique

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Received: 4 November 2015; Accepted: 7 December 2015; Published: 15 December 2015

Academic Editors: Wil de Jong, Pia Katila, Glenn Galloway and Pablo Pacheco

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Abstract: Although communities have been living within forests and dependent on forest resources, in Mozambique, their role was not formally recognized until the late 1990s. The forest law of 1997 was the first to refer to communities as stakeholders in the forest sector, in line with the national Policy and Strategy for the Development of the Forestry and Wildlife Sector. As a new element, several pilot projects were established during the late 1990s and early 2000s to produce lessons that would inform policy and technical aspects. Community forestry received most of the attention until the first decade of this century, however, it seems that while communities have gained a role in the management of the forest sector, there are still challenges to fully implementing and securing community forestry initiatives. In this study, we document the advent and evolution of community forestry in Mozambique, discuss the conditions for success in community forestry, and discuss two cases of community forestry that have survived over beyond the end of external support. We conclude that devolution and training are the basic incentives, but additional incentives, including diversification of sources of revenue from non-destructive forestry activities, are required to maintain the stability of community forestry over time.

Keywords: community forestry; Mozambique; Miombo; charcoal; timber

1. Introduction

Community forestry (CF) has been a developing concept since the late 1970s, in response to growing observations that forest dwellers were particularly poor and that although forest companies generated income from selling timber and non-timber forest products, forest dwellers received little or no benefit [1,2]. The concept gained higher dimensions with the introduction of the concept of sustainable forest management (SFM) [3], which included a social concept within the sphere of forest management. The central aspect of community CF to tap into the benefits generated by the sale of forest goods and services [1,2]. Although more than three decades have elapsed, realizing the final objective of reducing rural poverty through forestry remains a challenge [4,5].

In Mozambique, CF gained momentum with the reform of forest strategic policies and regulations in the late 1990s and the first decade of the 2000s [6]. While there was a proliferation of CF initiatives, in line with the government Poverty Reduction Action Plan (PARPs), at present these initiatives have been left on their own. The CF initiatives contributed substantially to shaping forest policies, particularly by introducing and promoting the community as a formal stakeholder in forest management [7]. The CF initiatives with external funding and strong government support were viewed as a way to empower forest residents and transfer knowledge to communities to be able to manage forests and receive benefits from forest business.

Evaluation of CF suggests that its major objectives are (i) alleviation of poverty by increasing the contribution of the forests to local economies, (ii) empowering forest dwellers to manage forests

based on local knowledge, and (iii) improving the condition of the forests. These objectives are not easy to balance [8]. Considering these main CF objectives, it was found that in some regions, while forest conditions improved, poverty showed no sign of being reduced [9], and in other regions, empowerment of local communities was hampered by complex government regulation, thereby reducing the ability of the forest dwellers to benefit from the forestry operations [5,10].

In this paper, we analyze the course of CF in Mozambique with a focus on the impact on policies and practices in forest management and we evaluate two CF initiatives using the three main objectives of CF as the principal entry points. Given the complexity of definitions and reach of “poverty alleviation” [2], we modified these aspects by asking (a) how local institutions effectively make decisions on the control and use of forest resources—as a way to evaluate the level of devolution of power to local institutions; (b) how revenues generated from forest operations reach the communities—therefore contributing to poverty alleviation; and (c) what local communities perceive the sustainability of the forest resource to be—as a way to evaluate the long-term goal of ecological sustainability to ensure continuity in provision of goods and services.

The paper is organized into three main parts. The first part (Section 2) is a general description of the role of CF in the context of SFM. The second part (Section 3) presents the impact of CF in forest policies and regulations in Mozambique. The third part (Section 4) is a description of two pioneer CF initiatives in Mozambique. The fourth part (Section 5) is a discussion on what local communities consider as positive incentives for them to continue with the forest initiative. The discussion is guided by the evaluation criteria presented above.

2. Community Forestry as a Base for Implementation of Sustainable Forest Management

The SFM concept has been used in the area of forest sciences as the mechanism to ensure the continuous supply of goods and services from forests over time [11]. This term became quite common in the late 1980s and early 1990s, and the Earth Summit in 1992 established the principles of sustainable development and the principles of sustainable forest management [3,12]. Indeed, it was during this period that forests began to take on a particularly important role as a development factor. Sustainable development as it is understood today was first defined in the report of the UN Committee on Development and Environment in 1987 as “development that meets present needs without compromising the needs and ability of future generations” [13]. Sustainable development is based on three important principles: economic, environmental, and social.

Establishing policies to promote SFM requires a range of measures that facilitate access to forest resources. Particularly, the property and forest-resources use rights are subject to a clear definition. Access to forest resources by rural communities in many tropical countries in Africa, America and Asia is restricted by national policies but, paradoxically, most rural communities live from the resources obtained from forests defined as state property. Therefore, it is believed that the first step for effective SFM is to provide access rights and ownership of forest resources so such communities can make management decisions about their resources [1].

Community Based Natural Resource Management (CBNRM) is intrinsic to the international political/legal framework on SFM [11,14,15], which considers the involvement of communities as an intrinsic component of SFM principles. The Convention on Biological Diversity (CBD) states that indigenous peoples and local communities should be allowed “to develop and implement adaptive community management systems to conserve and use sustainably the forest biological diversity” [15]. The African Timber Organization (ATO) states that “the communities’ rights and responsibilities in logging areas should be known, clearly defined and respected and the use of resources must contribute to improving their well-being, social, and environment conditions” [11].

Forests have also been recognized as important resources to contribute to achieving the Millennium Development Goals by providing goods and services for people living inside forests and also by providing air and water quality for the global community [16]. The Rio + 20 Declaration (The Future We Want) highlighted that forests “can make important contributions to sustainable

development through production activities that are environmentally sound, enhance food security and the livelihood of the poor, and invigorate production and sustained economic growth” [17]. Poverty reduction is still on the top of development agenda, and the Sustainable Development Goals include actions related to improvement of living conditions of the poor, with emphasis on people living in or near the forests [16]. Sunderlin *et al.* [2], after observing that forest dwellers are commonly poor people, suggested that the converging geography of forests and poverty may have different origins, but among these, historical aspects such as traditional/indigenous people living in remote and inaccessible areas far from urban areas, roads and limited markets are the most common.

Arnold [1] lists and analyzes eight conditions of successful CF in tropical countries: (i) fair partnerships and institutional arrangements and enabling environment; (ii) devolution of forest resources to local communities; (iii) common understanding and interests on forest resources within the community; (iv) forest resource availability; (v) access to markets; (vi) ability to manage conflicts; (vii) cost-benefit ratio; and (viii) appropriate incentives. This observation suggests that incentives do not work alone but are part of a package of complex issues that need attention to boost community forest management. However, it is not clear how incentives would differ from the other set of conditions. We consider the enabling conditions as incentives for successful CF.

Sunderlin *et al.* [2] presented and discussed the socioeconomic development, livelihood model, and forests relations, as presented in Table 1. While they recognize that the distinction among the three stages is not clear and all of them can coexist, they also recognize that most of the forest-based populations are in categories B and C. The model represents different stages of development and interaction between forest dwellers and their forest. Category C represents a relatively degraded forest, most of it converted to other uses that maintain the livelihoods, suggesting that the forest becomes less important as a source of income.

Table 1. Types of forest-based livelihoods and associated attributes of forest use.

Type of Livelihood	Associated Attributes of Forest Use			
	Main Type of Forest Use	Density of Forests	Mode of Forest Use	Forest Product Income as Share of Total Income
A. Hunting and gathering	Food: capture and collection of forest fauna and flora	High	Use value: high; exchange value: low	High
B. Swidden cultivation	Source of agricultural land restored by forest fallows Use and marketing of forest products	Medium	Use value: medium; exchange value: medium	Medium
C. Sedentary agriculture at forest frontier	Source of new agricultural land Marketing of forest Products	Low	Use value: low; exchange value: high	Low

Source: Sunderlin *et al.* [2].

3. Community Participation in Forest Management in Mozambique

3.1. Community as a New Element in the Mozambican Forest Sector

In Mozambique, CBNRM was adopted as part of the government's strategies for achieving the social objective outlined in the Policy for the Development of the Forestry and Wildlife Sector [18]. The policy was the first approach to address the concept of SFM, focusing on three pillars—economic, environmental, and social. While the previous forest legislation regarded local communities as merely subsistence users of forest resources, the vision of the CBNRM was to give additional benefits and power to local communities. These would include having a share of the forest revenue, rights to conduct CF enterprises, and co-management schemes with private and public initiatives in forest investments [1,10]. In a country where land and forest resources are state-owned and with a history of a centralized economy, CBNRM would also mean devolution of the forest resources to local communities so that decisions on community management can be taken locally [6]. These aspects

represented a dramatic change in the way local institutions and people perceived their relationship with forest resources. Therefore, experiments were established to provide a learning ground on how these changes can take place and community benefits can be obtained as part of the social contribution of forests to people living inside or near them.

The first of the CBNRM projects in Mozambique is Tchuma-Tchato, a wildlife community management project that began in Tete Province in 1995, well before the SFM forest policy was approved [19]. By 2004, more than 68 CBNRM projects were being implemented [20]. At present, the number of CBNRM is unknown, but we believe it has reduced significantly since 2010 as result of reduction in funding and technical support to CBNRM and the change in focus to privately managed logging permits and forest concessions. No figures are available on the number of people involved in these CBNRM, but Siteo and Tchaúque [6] estimate the area covered by CF initiatives across the country to be about 2 million ha.

The growing number of CBNRM initiatives helped to shape the policy in the forestry sector to accommodate the community as an important player in management of the natural resources arena. The experiments in participatory processes, intensively used during the review of the law and regulation of forest and wildlife, were achieved with the support and collaboration of members of the communities where CBNRM initiatives were taking place. Community participation in the management of natural resources as well as the review of sector laws and regulations were innovative processes for both Forest Service technicians and the communities involved. As a result, the Forest and Wildlife Law [21] and the Forest and Wildlife Regulation [22] formalized communities as stakeholders in forest management and opened possibilities for organized communities to initiate forest businesses themselves, participate in co-management of forest resources either in public or privately managed forests, such as the forest reserves, and obtain benefit from the forest revenue generated through the taxation of logging and hunting operations (Table 2).

Table 2. Forest management regimes in Mozambique and options for community engagement.

Forest Ownership Category	Description	Management Regime	Examples of Community Participation Initiatives
Protected areas (national parks, forest reserves, hunting reserves)	National protected areas, established by the state initiative for protection of biological, cultural, and historic values	State managed, but may include co-management with community, community participation, or delegation of authority to community	Derre (Zambézia) and Mecuburi (Nampula) Forest Reserves
Protected areas (local and historic and cultural reserves)	Established by local initiative to protect sacred forests and forests with local importance	Community managed, but facilitated by the state or NGO, with or without private partner	Chirindzene (Gaza) and Potone (Nampula) Community Reserves
Community land on multiple-use areas	Forest lands in areas not designated for permanent forest production	Community managed, but facilitated by the state or NGO, with or without private partner	Pindanyanga (Manica) and Mucombedzi (Sofala) Community Forestry areas
Private forest concessions on natural forests	Natural forests of high timber productivity granted for private use on a long-term basis (up to 50 years, renewable)	Managed by the private concessionaire; a forest management plan required before forest concession can be granted	Matondo (Sofala)
Private forest plantations	Exotic-species forest plantations, mainly with Eucalyptus and Pinus	Managed by private companies	Penhalonga (Manica)
Public forest plantations	Exotic-species forest on public land designated for protection, timber, or biomass production	Managed by the state through the Forest Service by the district administration	Bilene (Gaza), Milha 8 (Sofala), Inhaca and Namaacha (Maputo),
Community forestry plantations and agroforestry	Woodlots, home-gardens, hedgerows, and other agroforestry arrangements within households and community land	Established and managed by communities, but tree tenure not well-established	Xai-Xai (Gaza) afforestation project

Source: Adapted from Siteo and Tchaúque [6].

The potential community-forest management options (Table 2) can be applied in a variety of situations depending on the initial conditions and partnerships. Note that not all options presented here are taking place, and there are situations where the law or the business environment limits the practical existence of certain forms of management. The Forest and Wildlife Law [21] still gives to the state a stronger ownership of resources. For example, in spite of the fact that local communities have rights to make local decisions on forest management, the potential for commercial gain from forest resources remains dependent on the success of the concession application or logging license

permit issued by the Forest Service, putting communities and the private sector on equal footing [23]. Authors such as Schafer and Bell [24] and Dewees *et al.* [25] noted that although communities have been brought to the playground, they are still ill-equipped (mostly technically and financially) to play, suggesting that devolution must be more effective for the communities to realize the benefits from forests.

Evaluation of the effectiveness of community participation—based on a review of legal instruments [6,7,26,27]—suggests that despite the lessons learned, there is still much to discover from this interaction. On the one hand, the forestry institutions must learn to create space for communities to manage their forests and to share the benefits from forestry operations; and, on the other hand, communities must learn to make use of their rights, including conducting an appropriate management of forest resources.

3.2. Contribution of Community Forestry to Poverty Reduction

While the principles of SFM and CBNRM evolved, and because sustainable development has a strong social dimension that emphasizes poor communities, most poor tropical countries developed their own national poverty reduction strategies (e.g., PARP in Mozambique) including forestry as an important component. The contribution of the forest sector in combating poverty comes through a series of actions to be carried out under the principles of SFM. These actions include, among others, improving access to forest resources and the generation of benefits from forestry activities for local communities. The contribution of biological resources (and in particular forests) to poverty reduction is the basis of the Convention for the Conservation of Biodiversity. In addition, the conventions on climate change and on combating drought and desertification clearly express the need to use these tools as a means of reducing vulnerability and generating benefits to improve the living conditions of the poor [15,28].

In Mozambique, poverty is typically rural [28]; however, increased urban poverty has been recently reported as a result of rural-to-urban migration [29]. High positive correlation was found between poverty and forests [28]. The contribution of the forestry sector to the national economy is recognized not only by the high dependency of the population on forest products for local uses such as fuelwood, building materials, medicinal plants, food (including plants and animals), among others [6] but also for the provision of timber for international markets [30]. Dewees *et al.* [25] and Angelsen *et al.* [31] observed that poor rural households are not getting rich by tapping into markets for forest products, but that they are vitally dependent on woodlands because of their role as a safety net.

The Policy and Strategy of Forests and Wildlife [32] is in line with the PARP [33] and the Millennium Development Goals [34], and work is underway to ensure that forests will continue to play an important role for the Sustainable Development Goals [16]. In all these policy and strategic instruments, community participation is highlighted as a means to ensure the contribution of the sector of forestry and wildlife to poverty reduction.

3.3. From Open Access to Community Forestry

Before inclusion of the community in the forest legislation, communities did not have rights other than subsistence use. The Forest Service issued logging licenses without consulting local communities, and revenues collected from this process did not go to the local communities. The lack of a clear definition of the role of customary rights to forest resources resulted in passivity on the part of communities and their viewing forests as “open resources” where they did not have the right to exclude any operator that wanted to extract or use the forest resources. The forest resources did not, in fact, belong to communities, and they had no voice in either excluding outsiders or requesting any benefit resulting from such processes [6].

After the revision of the forest legislation to include communities as key elements in forest-resources management, organized forest residents have the right to negotiate and eventually

exclude forest operators not conforming to their customary rules. This is possible because the current legislation provides that (i) the Forest Service is the legal institution to manage the forest resources and has the power and responsibility to issue logging licenses and assign forest concession areas to forest operators, who in exchange, have to pay logging fees and other relevant taxes and also promise to conduct sustainable management through a forest management plan; (ii) 20% of the logging fees must be returned to communities living inside the forest where logging took place; and (iii) before the Forest Service can issue a logging license to a company, the logging company is required to consult with local communities, who by customary law, have the rights to the forest resources. In this process, communities could negotiate additional benefits to be provided by the company in cases when they decide to transfer their forest-use rights to the company [6,7].

The coexistence of the statutory and customary rules on forest resources in a country where forests are state-owned has generated a mixture of interpretations, sometimes contradictory. While not all communities are informed of the new legislation, they are not being consulted properly or they are not getting their share of benefits from the logging fees. On the other hand, there are communities that are aware of the recognition of customary rights that make exaggerated requests in their negotiations, asking for such things as the building of school classrooms or health centers. There are also reports of communities that understood that recognition of the customary rights meant that they could issue logging licenses and collect fees decided by local institutions. All these models have been observed in many parts of the country, in some areas facilitating illegal loggers. CF requires the ability to balance statutory and customary rules.

3.4. Conditions for Success in Community Forestry Initiatives

Successful CF depends on several conditions. As a new element in the forestry sector, communities need space and an appropriate environment to succeed. Dewees *et al.* [25] evaluated the policies, incentives and opportunities in southern African woodlands and concluded that while there are opportunities to improve the management of dry woodlands, forest degradation was still a problem. These authors have also argued that while regulatory measures have created opportunities for communities, these have also limited community participation by requiring complex paperwork to realize the legally established benefits, resulting in illegal activities being easier and more attractive than the legal ones.

Dewees *et al.* [25] suggest a set of four major actions to improve sustainable management of dry forests of southern Africa: (i) revitalization of forestry organizations; (ii) getting forestry onto the poverty reduction agenda; (iii) devolution of rights and responsibilities for woodland management to the local level; and (iv) enhancing forest-based markets for products and services. Siteo *et al.* [27] evaluated the community-forest management projects in Mozambique and suggested that incentives would be required to increase community participation in forest management. These would include (i) training of the local community in the use of modern technologies to ensure the success of a community initiative and allowing an improvement in the quality and quantity of the final product; (ii) tax exemption or reduction on the import and export of goods and services to create a favorable environment for the participation of the partners in CBNRM initiatives; (iii) establishment of interest groups in small autonomous companies, self-sufficient and with good market integration, to encourage them to participate in forest resource management; and (iv) provision of credit for different stakeholders who want to start a business to diversify forest goods and services—such as ecotourism—within a community area.

All these suggestions of actions and incentives are in line with the need to facilitate communities as new stakeholders who need environment-enabling conditions to participate effectively. In the next section, we analyze two community projects established as pilot projects in the late 1990s, namely Mucombedzi and Pindanyanga CF areas. These two projects are among the few that continue in operation after the end of external support of the project. In an ideal condition, we would expect most of the pilot projects to be able to continue, considering the investment made to generate lessons

and training in local communities. The projects were visited in May 2015 with the objective of understanding the key to success and the challenges in community-forest management.

4. How Community Forestry Initiatives Survived: The Case of Mucombedzi and Pindanyanga

Mucombedzi and Pindanyanga are two of the community projects established in 1999–2000 with the main objective to generate lessons to shape policies and technical information in support to CF in Mozambique. Both were setup as community forest concessions located in Miombo woodlands of Sofala and Manica province, respectively, separated one from another by about 50 km. Although close to one another geographically, they belong to different provinces and therefore are subject to different provincial forestry administrations. Pindanyanga's main objective is for the production of timber; Mucombedzi, for production of charcoal. Participatory forest inventories and management plans were prepared by experienced forestry specialists and financial support from a FAO project funded by the Dutch government.

During the duration of the CF pilot projects, the community and committee members had very close technical and financial assistance from the government. Members of the committee, apart from training, participated in exchange visits to be exposed to experiences of other communities where similar initiatives were taking place. They were also visited by other communities and institutions and were largely used to show the good practices of forest management to national and international institutions. In fact, it was the first time in Mozambique that these initiatives were being implemented, and politicians, technicians, academics, and civil society members were eager to see what such a new structural organization looked like and how it functioned. Several other CF management initiatives took place in other regions, replicating this and other models developed in this period.

4.1. Mucombedzi Community Forest

Mucombedzi Community Forest (MCF) project was established in an area covering 22,365 ha in 2000 by the provincial forest service and the FAO project as one of the pilot projects of community-forest resource management. The main purpose of the project was to enable local communities to manage their forests to produce charcoal for sale in a sustainable manner and prevent outsiders from taking advantage of their resources without compensating local communities. Before the project, outsiders (mainly from the town) would enter the community's forest without authorization of local institutions and produce and sell charcoal. Outsiders would increase pressure on the natural resources to supply charcoal to the towns of Beira and Chimoió, leaving degraded forests behind. Local residents were having their forests degraded without benefiting from the extraction of forest products. The outsider charcoal makers would then move to other communities in search of more forests.

Charcoal is commonly produced after logging has taken the valuable timber species from the forest; therefore, clear-cut is the common logging practice for charcoal. The area could eventually be converted to household agriculture or simply left as degraded forest. Trees with very hard wood, such as *Burkea africana*, and commercial timber species, such as *Pterocarpus angolensis* and *Millettia stuhlmannii* (which are protected by the regulation from being used for charcoal), are not cut and are left standing. The MCF area has two types of soil, one is typically loamy-sandy, good for agriculture, and the other is stony, not preferred for agriculture. The forests on loamy-sandy soils are converted to agriculture after clear-cutting for charcoal. Major crops are maize, millet, beans and cassava for household subsistence and sesame as cash crop. The forests on stony soils are left to regenerate. Although most of the Miombo species, particularly *Brachystegia* spp. and *Julbernardia globiflora*, do coppice successfully, there is no management of the coppicing trees.

MCF maintains the community committee operational with the members adhering to the rules agreed upon by the committee. The community was trained in participatory forest management techniques, including control of access to the forest to prevent invasion from outsiders, control

and prevention of forest fires, and improved charcoal kilns, among other techniques. They also participated in forest measurement and preparation of the forest management plan that developed general forest management guidelines that defined annual harvesting plots and the estimated number of charcoal bags that could be produced sustainably. The forest management plan was set for an initial period of 10 years, but it is now more than 14 years old and was never updated due to lack of technical capacity. The committee initially had 10 members and later increased to 15, but now only 13 are active after one died and another was excluded due to a behavior incompatible with his position as a committee member. The committee members were chosen by the local authority (*fumo*), while the community traditional chief (*régulo*) is also a member of the committee. This procedure was followed to ensure close linkages between local authorities and the committee.

The main tasks of the committee are to (i) train community members to prevent forest fires; (ii) produce 40,000 seedlings per year for the neighboring Nhambita carbon reforestation project on a contractual basis; (iii) manage a charcoal license of an annual production of 15,000 bags per year, as estimated in the participatory management plan; and (iv) manage a license to produce 1000 bunches of bamboo poles per year, as suggested by the participatory forest management plan. The committee members do most of the work, but other community members also contribute to activities. Charcoal is largely produced by community members, but the committee ensures control: a local community member who wants to produce charcoal must first inform the committee, which will allocate the area and mark the trees that can be cut down for this purpose. Commercial timber species are protected and cannot be used for charcoal, therefore are not cut. There is no rule in terms of tree size, resulting in clear-cutting in most of the cases. After production of the charcoal, the committee buys the charcoal at the price of 2.6 USD per bag. When a certain amount (at least 200 bags) is reached, the committee hires a truck (capacity 350 bags) that collects all charcoal bags to transport to the markets in Nhamatanda (truck hire cost: 167 USD; price: 5–8 USD per bag) or Beira (truck hire cost: 670 USD; price: 10–12 USD per bag). In all cases, the license paid to the provincial forest service is 2.3 USD per bag, of which 20% goes back to the community as part of the community benefit sharing as established by the forest regulation.

The money obtained from the sales is deposited in the bank account of local committee. The use of this money is determined by the committee: the members do not have a salary, but there is a subsidy given to each committee member depending on sales. The larger amount is used for community benefits, including maintenance of the camping site and rehabilitation of school classrooms. The community camping site has potential to generate further revenue, but in spite of its proximity to the Gorongosa National Park, it has very limited impact. Using community funds for school rehabilitation is sometimes seen as a diversion of resources, considering this is the responsibility of the government.

The FAO project direct support to the community ended in 2007. Since then, the community and committee members have faced new challenges to maintain the activities. They had to continue with implementation of the forest management principles they had learned. With direct assistance from the Forest Service reduced, the committee has had to produce its own initiatives to adapt to the increasing pressure on the forest resources and the land. Since the end of the project, the community has had a few initiatives that have helped to keep forest activities operational, particularly assistance from ADEL Sofala, a local NGO that trained forest scouts and provided bicycles to increase their mobility to control forest access and that trained community members to make improved charcoal stoves. The committee continues to do reasonably well, with regular weekly meetings, forest patrolling, and communication with the provincial Forest Service.

4.2. Pindanyanga Community Forest

Pindanyanga Community Forest (PCF) is an initiative established in 1999 that covers an area of 31,300 ha. It has a committee of 21 members, including local forest scouts, of which only three are women. The procedure used to nominate committee members is similar to that used in Mucombedzi.

The initiative was among the pilot projects set up to test the applicability of community forests in Mozambique. The main objective of the PCF is logging for timber production. Given the complexity of obtaining a forest concession category (which requires the establishment of an industry), the community is provided with short-term logging permits (up to five years) issued by the provincial Forest Service. In addition, they also have an annual license for charcoal production and bamboo extraction. The committee members received training courses in issues related to community forest management and took part in exchange visits where they could learn lessons from other communities. The community also received visitors from other communities and technicians from other countries who came to learn from the Pindanyanga experiences.

The CF committee has the responsibility to pursue and manage the logging license, liaise with private operators—who actually do the logging, buy bulky charcoal and bamboo poles—protect the forest from fires, and check forest products transported through the community.

The current logging fee is 19 USD per m³ paid to the Forest Service. The forest operator that uses the community license must pay back the logging fee plus a community fee of 5.7 USD per m³. Sometimes, in addition to the community fee, the forest operator is asked to provide additional social benefits, such as building material for social infrastructure—for instance, roofing sheets for schools. There is a written and formal contract between the community and the forest operator, indicating the terms and conditions of the logging. For 2015, for instance, the contract indicates that the forest operator is allowed to log 500 m³ of 10 timber species. While 500 m³ is the annual allowable cut for a short-term logging license (up to five years), the community can allow one operator at a time for timber, with additional operators for bamboo and charcoal. The contract is signed by both parts (community committee and the forest operator) and it is monitored by the committee. No independent party is involved for certification or verification of the contract. The operator must hire local workers but is allowed to bring specialized workers—such as tractor and chainsaw operators and a forest measurer.

The relationship between the committee and the community is good. The community members not belonging to the committee help with patrolling and reporting mismanagement of resources and any strange movements of people who may seem to be illegal loggers in the forest. The money paid by the operator and the value of 20% of the logging taxes that is returned to the community is used for community benefits. The decision is made in a meeting involving not only the committee members, but also local traditional authorities (*fumos*, *sapanda*, *régulo*, and village chief). Up to now, the community has used the money to build four classrooms and ten houses for teachers, and provided funds for rehabilitation of local school. Committee members do not have a salary but may receive a symbolic fee when money is available. The fee value depends on the availability of cash, but there is always a part that goes for social improvements. The local traditional authorities receive a share of the benefit as part of the committee.

The community has a land certificate of 31,300 ha (including farms), nearly half of which is forest. The forest area has been decreasing because of an influx of people looking for agriculture areas: the local authorities (*fumos* and *régulos*) are the ones who allocate land for new settlers. Areas with good soils and potential for agriculture are allowed to be converted and downed trees are used for charcoal.

The forest management plan was to be revised after two years, but there is no capacity in the community to conduct a forest inventory. Therefore, there is no current knowledge of forest resource availability. However, there is a general perception that the forest is decreasing due to forest conversion to agriculture and logging. Although the government's policy is to restore forests and plant trees, little has been done at the community level.

The main motivation of the committee members is “to honor the trust given to us by the Pindanyanga community and the local government”. One community member said, “The will of members is positive and committee activities do not disturb the normal course of personal activities”. Since the end of the project in 2009, the committee and the community have continued alone, using the lessons learned and maintaining interaction with the provincial Forest Service.

5. Discussion

5.1. Devolution of Land and Forest Resources to Local Communities

Devolution of forest resources and responsibilities has often been identified as key to ensuring community forest management [1,5,8,35]. In the cases of Mucombedzi and Pindanyanga, the land delimitation was facilitated by the Forest Service as part of the technical assistance between 2003 and 2005. In addition, the Forest Service helped define the focus of the forest management—timber in Pindanyanga and charcoal in Mucombedzi—and prepared the respective participatory forest management plans. The focus of the forest management objective was based on resolving existing problems, in which forests were being degraded without generating benefits to the community. Land delimitation and the forest management plan are seen here as the major incentives that helped the process of devolution of the forest to local communities. Handing the responsibility of forest management to a locally controlled committee meant that they had the basis to make local decisions.

Dewees *et al.* [25] suggested that devolution of rights and responsibilities should be the first step toward improving sustainable management of dry forests in southern Africa. They further mention that devolution is more effective when rights of use and access are completely—rather than partially—devolved, when these rights are locally well-understood, and when they are supported by an enabling policy and legal framework. Devolution is also indicated as an enabling condition in other regions of the tropics [1]. In the studied cases, understanding of the rules was facilitated through training courses and exchange visits to other communities where the community-forest management committee had the opportunity to learn the concepts of forest management, market conditions, and land and forest legislation, among others, that further facilitated the quality of the decision-making process at the local level. An enabling policy and legal framework was ensured through coordination between the community committee and local authorities, as well as with the Forest Services, which provided the basis to align the local customary rules with statutory rules. Siteo *et al.* [7] and Novela [36] referred to conflicting statutory and customary rules as a major limitation in certain areas of Mozambique, where diverse interpretation of the rules created room for illegal logging operators, leaving limited benefits to local communities and causing revenue losses to the forestry sector.

Contrary to areas where local communities do not have vested power to decide over the forest resources [36], the Pindanyanga and Mucombezi community committees used the land certificate and the knowledge about forest patrolling to restrict access of outsiders, especially those who seek to produce charcoal or produce timber from the local forests. In practice, local authorities, in collaboration with the CF committee, are responsible for allocating land for new settlers and selling forest products. Outside charcoal makers are not allowed to operate in the community area, but those who want to buy timber or charcoal can access the resources, paying the local market price. There is strong coordination between the community and the Forests Service in the way that the logging and charcoal licenses are issued to the community and the committee does the negotiations with buyers to get extra benefits. Because timber logging operations are more costly, it is the outside operator who hires workers under the community logging license and pays the established fees, while local community members produce charcoal and bamboo and sell to outsiders. Jagger *et al.* [37] studied community income generated from forests and found that state-owned forests generated higher income than community-owned forests, but restricting access in these forests reduced the income. In our study, the forest is state-owned but access restriction is exerted by the community itself to maximize income.

5.2. Access by Local Communities to Benefits Generated from Forest Operations

The studied areas based their business on selling unprocessed forest goods: logs, charcoal, and bamboo. No other relevant products with market potential were identified. Although these goods are indeed basic, with no value added, high extraction costs (especially manpower) and low prices,

these communities are among the ones that best tap the value of the forest. The studied community forests have secure and legal markets following transparent and legal procedures.

Charcoal producers are not organized as associations; outside of the community forests, these producers sell a few bags by the roadside at low prices (2.6–3.5 USD per bag), while CF areas sell large quantities with a better price. Their ability to reach the town markets gives them the ability to get better prices: 5.0–8.3 USD per bag in the nearest district town of Nhamatanda and 10–12 USD per bag in Beira. Even considering the costs of transport, the benefit is 56% or 150% higher when selling the charcoal in Nhamatanda or Beira, respectively. The market is secure since the towns depend largely on charcoal for household energy.

By adding a community logging tax of 5.7 USD per m³ (about 30% of the regulated logging fee) to the logging operators, Pindanyanga CF is tapping from the logging operations. This is in addition to the 20% community benefit sharing returned back to the community by the Forest Service, the additional benefits obtained from negotiations with the operators, and the jobs in logging operations offered to local residents. Even though these are considered low when compared with the price of the logs in town (the log yard price is 400 USD per m³), these are by far better benefits compared with areas outside CF. The benefits obtained outside of the study area, in areas without a community organization, consist mainly from the jobs created by logging operations, and eventually, the traditional leader and his family receive certain amount of money. Novela [36] reported communities in Zambézia Province, outside of CF areas, whose traditional leaders—unaware of the statutory rules—used traditional rules to “allow” illegal loggers in exchange for a chicken and a bottle of wine. Lack of knowledge on the real benefits that the community can obtain by using statutory regulation combined with customary rules prevented these communities from capturing the value of the forest, and the little amount received benefited only the traditional leader and his relatives.

Community organizations are in position to negotiate better prices and find better prices using their network of contacts with the Forest Services or forest operators. The fact that the Forest Service will refer a forest operator to a certain community area is a great advantage to local communities. Obtaining tangible benefits has been at the heart of CF as the main incentive that motivates local communities to engage in management of forest resources. The final declaration of the National Conference on CBNRM in Mozambique held in 2013 [38] stated that CF succeeds if tangible benefits can be attained and fair and transparent partnerships with communities can be established. In the case of the studied areas, we found that communities were able to generate benefits from the forest products and prevented outsiders from access to forest resources without community permission. At the same time, the coordination between the community and the Forest Service allowed them to control illegal logging and charcoal making, thus generating more revenue for the Forest Service and the community.

5.3. Ecological Sustainability to Ensure Continuity in Provision of Goods and Services that Create Benefits to Local Communities

The contribution of forest products to the local economy in the studied communities is high, yet in risk of decline. Both communities recognize the decrease of forest area as a result of extraction of forest products and agricultural expansion. Both communities are located in the forest frontier, where local residents as well as immigrants expand their areas via slash-and-burn farming. While community forestry has reduced the speed of forest degradation and helped channel the revenue of the forest products for local benefits, its sustainability is not given.

Using Sunderlin’s [2] model, presented in Section 3.1, to characterize the studied areas, we believe that these are mostly in Category B, with a tendency to C. The conversion of the forests into agricultural areas in these areas is for household subsistence as well as for cash crops for national and domestic markets, particularly cotton, sesame, and maize. Sunderlin *et al.* [2] also recognize that in the course of transition through these models, forest products may become scarce and less relevant, while agriculture increases its contribution to local economy.

Sustainability of the CF model in Mucombedzi was evaluated by Guedes and Siteo [30], who, after observing that local residents have been noticing reduction in a variety of forest products for local use, found that residents also have been increasing their income from agriculture. These authors suggest that local residents have been adopting measures to adapt to the reduced availability of forest resources. These measures include community forest plantations and use of alternatives to forest products for local uses, among other non-forest-related activities such as expansion of agricultural areas and digging for gold.

Attaining sustainability in CF may be challenging, especially when demand for forest products is higher than supply and demand for agricultural land has also been pushing the forest frontier. These aspects were observed in Burkina Faso [39], where managing forests and planting trees are being suggested to increase fuelwood availability, as a measure for REDD+. Market pressure can disrupt local rules, and local communities may be pushed to produce more charcoal and timber than the capacity for forest growth. This could also be aggravated by limited knowledge about current forest conditions. In the studied communities, it was reported that the forest management plan was outdated, and the communities did not keep records of areas, logging volumes, charcoal bags produced, and areas converted for agriculture, among other data that could be used to evaluate the rate of forest product exploitation and forest conversion. Coppicing management, tree planting, and alternatives to slash-and-burn agriculture can increase chances to improve forest conditions. Evaluation of other non-extractive activities such as ecotourism (e.g., using the proximity to the Gorongosa National Park) can improve further the chances to maintain and improve forest conditions. In the Philippines, Walter [40] reported an example of engagement of communities in planting and management of mangrove forests to counteract the pressure of tree cutting and conversion for other uses. Walter's experience included ecotourism to increase income from non-destructive activities.

6. Conclusions

The results of this study suggest that the theory of community forest management is relatively simple and well-understood by several actors. Inclusion of the community as a valid stakeholder has contributed significantly to framing current forest policies and legislation. As a result of forest-policy reform, space was opened to share forest revenues with forest dwellers and provide local communities with the basic means and knowledge needed to manage their forests.

The experiences in Mozambique suggest that local communities still face challenges to fully realize these benefits for reasons that include conflicting perceptions and interpretations between customary and statutory regulations and complex and restricting forest policies toward community participation, among others. In this context, we consider that external (out of the community) financing, technical advice, training, and exchange visits work as incentives that facilitate engagement of communities in forest management activities. Informed communities, such as those presented in this study, are the ones that have ability to exclude outsiders from their forests and therefore exert the power to decide locally how to exploit forest resources. An important incentive is the support that CF initiatives have from the Forest Service toward reducing incidence of illegal logging and exploitation of other forest resources by outsiders. While external support was reduced at the end of project implementation, the two CF projects studied maintain the ability to get higher revenue from the forest when compared to communities outside CF. Receiving monetary benefits from decisions made locally about their forest resources is, after all, the major incentive to keep the initiative ongoing.

There is no doubt that forest resources generate income to the studied community forests, but converting forests to other uses also generates income and subsistence goods. Forest-based income alone does not support the needs of community households; it is used to complement other sources of income. At present, while forest area is still large and population density is relatively low, the community residents can have their forests and generate income from them, convert the forests to increase income from other non-forest activities, and diversify sources of income as well to make their

livelihoods more resilient. In fact, in years of bad agricultural harvests, forest-based income works as a safety net. This model (of having a forest, exploiting it, and converting it, but not losing the forest) is considered fragile and depends on conditions that are not directly in the forest sector. Increase in agricultural commodities (such as sesame and maize) may fuel forest conversion to agricultural land. In addition, population growth would push the agricultural frontier further and reduce the forest area, a phenomenon already perceived by members of the studied communities.

While most forest management activities concentrate on excluding outsiders, administering the logging licenses, dealing with forest-product markets, and coordination with the Forest Services, little is done to promote forest growth, replanting, coppicing management, and conservation. This is an area where there is little knowledge; however, this focus is essential for improving forest conditions and ensuring sustainable availability of forest goods and services. Considering the pressure on the forest, evaluating alternatives to extractive forest activities, including ecotourism, and slash-and-burn agriculture, among others, would represent options to improve forest conditions.

Finally, we conclude that a set of incentives is required to ensure CF management: (i) devolution—trusting forest dwellers in forest management decisions; and (ii) training—to improve perception of coexistence of customary and statutory rules, strengthening and providing support to CF organizations. These incentives will result in income generation for local communities and further improve their ability to continue and maintain forest management activities. Long-term sustainability of CF management requires that income can satisfy the household requirements; therefore, additional incentives should focus on increasing forest-based income, considering non-destructive forestry-income generation, or increasing productivity from non-forest-based income as a way to reduce forest conversion to other land uses.

Acknowledgments: We would like to thank the community members of Mucombedzi and Pindanyanga who shared with us their experiences in implementing community forest management. We thank Ivan Remane and Silvia Maússe-Sitoe, who reviewed earlier versions of this paper, and Pia Katila and Wil de Jong of the IUFRO WFSE, who provided the initial ideas to write this paper and also provided important inputs for the manuscript. We thank Ree Sheck for English language editing. We also thank two anonymous reviewers who provided useful comments and suggestions to improve the article.

Author Contributions: Almeida A. Sitoe: conducted visits to the study sites, drafted the manuscript, and submitted the paper. Benard S. Guedes: used his experience in community forestry and the local knowledge of the study sites to review and shape the content of the paper.

Conflicts of Interest: The authors declare no conflict of interest.

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