

Does REDD+ have a chance? Implications from Pemba, Tanzania

JEFFREY B. ANDREWS, TIM CARO, SAID JUMA ALI, AMY C. COLLINS
BIDAWA BAKARI HAMADI, HASSAN SELLIEMAN KHAMIS, ABDI MZEE
ASSAA SHARIF NGWALI and MONIQUE BORGERHOFF MULDER

Abstract Conservation scientists continue to debate the strengths and weaknesses of REDD+ as an instrument to slow greenhouse gas emissions in the developing world. We propose that general positions on this debate are less helpful than drawing lessons from specific investigations into the features of individual projects that make them successful or not. Here, focusing on a site-specific REDD+ intervention in Pemba, Zanzibar (Tanzania), we examine the circumstances under which REDD+ has a chance of success, teasing out specific features of both REDD+ interventions and the socio-economic and institutional contexts that render REDD+ a potentially valuable complement to community forestry. Additionally, we highlight some unanticipated positive outcomes associated with the design features of REDD+ projects. Our broader goal is to move away from ideologically-driven debate to empirically-based identification of general conditions where REDD+ could work, and to provide policy recommendations.

Keywords Carbon payments, community forestry, Pemba, REDD+, Tanzania, Zanzibar

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Introduction

REDD+ (Reducing Emissions from Deforestation and forest Degradation in developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries) was adopted by the Conference of Parties to the United Nations Framework Convention on Climate Change in 2007 as a strategy to slow forest loss and as a mechanism for sustainable development. Since then REDD+ has become the largest anti-deforestation initiative in history (Angelsen, 2017), drawing on a complex set of multilateral, bilateral, private, corporate, foundation and domestic investment sources (Environmental Defence Fund, 2018). More than 50 countries have initiated REDD+ programmes, and there are now > 350 projects across the tropics (Duchelle et al., 2018). Most, however, have no access to the anticipated performance-based finance from voluntary carbon markets (as defined by Seymour & Busch, 2016, see also Simonet et al., 2014; Sunderlin et al., 2015; Angelsen, 2016), but rely instead on results-based multilateral or bilateral aid (Duchelle et al., 2018). Prompted in part by this uneven process in establishing successful REDD+ programmes, a divisive literature has emerged. Some see REDD+ as simultaneously positive for carbon, biodiversity and poverty alleviation (e.g. Angelsen, 2008), citing proven results (Jayachandran et al., 2017) and its potential to garner public and private finance (e.g. Seymour & Busch, 2016). Others are concerned with the dangers to local community well-being inherent in commodification and monopolization of natural resources (Phelps et al., 2010; Sandbrook et al., 2010), particularly in contexts with poor governance structures where vulnerable populations are at risk of displacement by multinational corporate interests (for an example, see McDermott, 2017). For this reason most now agree that monitoring of non-carbon outcomes (co-benefits such as livelihoods, tenure security, equitable benefit sharing and biodiversity; Hinsley et al., 2015) is critical.

Much of this debate stems from viewing REDD+ as a monolithic, singular entity. In reality, programmes represent a wide variety of institutional forms, some of which function better than others, and vary with respect to their fit to the institutional and socio-economic context. Systematic comparisons of REDD+'s empirical successes and failures are thwarted by the highly diverse nature and structure of

JEFFREY B. ANDREWS (ORCID orcid.org/0000-0003-1130-0423) and MONIQUE BORGERHOFF MULDER* (Corresponding author, ORCID orcid.org/0000-0003-1117-5984) Department of Human Behavior, Ecology and Culture, Max Planck Institute for Evolutionary Anthropology, Leipzig 04103, Germany
E-mail mborgerhoffmulder@ucdavis.edu

TIM CARO (ORCID orcid.org/0000-0001-6804-8519) and AMY COLLINS Department of Wildlife, Fish and Conservation Biology, University of California, Davis, USA

SAID JUMA ALI, ABDI MZEE and ASSAA SHARIF NGWALI Department of Forests & Non-Renewable Natural Resources, Wete, Pemba, Zanzibar, Tanzania

BIDAWA BAKARI HAMADI and HASSAN SELLIEMAN KHAMIS Jumuiya ya Uhifadhi wa Misitu ya Jamii Zanzibar, Wete, Pemba, Zanzibar, Tanzania

*Also at: Department of Anthropology, University of California, Davis, USA

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REDD+ projects, and their scale, community involvement, certification standards and dependence on market-based mechanisms (Simonet et al., 2014). Put another way, the degree to which site-specific design features align with broader economic/social/cultural institutions, such as free markets, rule of law and public opinion will determine the success and appropriateness of different REDD+ designs.

Consequently, debates regarding whether it is worth persisting with REDD+ as a global strategy, and in what form, should shift towards determining the specific contexts in which the instrument could be effective. We advocate such a transition because general debates concerning neo-liberalism and environmental commodification, although important, do not provide definitive guidance for immediate global challenges.

To this end we (a collaboration of partners involved with REDD+ either directly as government and non-governmental implementing agencies, or indirectly as academics) review the situation surrounding a REDD+ project in Zanzibar, Tanzania. We identify and discuss salient features of the project as implemented on the island of Pemba that, to the extent to which they are generalizable, demonstrate how, and under what specific conditions, REDD+ could be a valuable mechanism for reducing greenhouse gas emissions. In particular, we draw attention to the source of the threats (corporate and/or community), the importance of pre-existing management institutions, often overlooked complementarities between centralized and decentralized management, and counterintuitive consequences of leakage.

REDD+ in Zanzibar

In 2009 Tanzania was identified as an appropriate country for piloting REDD+ because of its extensive dry tropical forest cover and rapid rates of deforestation. With the principal support of the Norwegian government, Tanzania established eight site-specific REDD+ pilot projects, for which USD 93 million was pledged (Burgess et al., 2010). These initiatives aimed to revitalize a history of local community-based forest management, to secure land rights, to invest in local capacity for measurement, reporting and verification, and to engage the private sector (Burgess et al., 2010; Katani et al., 2016; Lund et al., 2017).

One of these projects is Zanzibar's Hifadhi ya Misitua ya Asili programme, implemented under CARE International. Zanzibar consists of two main islands (Unguja and Pemba, the latter known as the Green Isle; Supplementary Material 1). Pemba and Unguja are characterized by a mix of mangrove forest (7% on both islands combined but 13% on Pemba), coral rag forest (37% and 12%), high forest (4% and 2%), and agroforestry (32% and 44%) (Revolutionary Government of Zanzibar, 2008; Terra Global Capital, 2014). As a result of a long history of agroforestry, the

original native forest is limited; the remainder contains a mixture of native forest with agroforestry species (introduced fruit, nut and spice trees). The annual rate of deforestation across both islands is 1.1% (Revolutionary Government of Zanzibar, 2014), driven primarily by population pressure (growing at 3.2% per annum; Siex, 2011) and poverty (on Pemba 90% of the population relies exclusively on charcoal and firewood for cooking). Fuelwood and charcoal account for 37% of the drivers of deforestation, shifting cultivation and fuelwood lots for a further 26%, and timber (for house and boat construction) for 5%; activities are conducted primarily by local community members, less so by local entrepreneurs (Terra Global Capital, 2014). Thus, deforestation on Pemba is primarily a function of household rather than business or government interests, unlike many other threatened forests globally (Hosonuma et al., 2012). Only 14% of all biomass consumption is accounted for by institutions and business (which are primarily local bakeries; Terra Global Capital, 2014). Rates of deforestation are expected to increase with population growth, renewed pressure for clove production (as global prices increase), and illegal offtake associated with construction for a burgeoning tourist sector on the southern island (Unguja) and government/military installations in the archipelago (Revolutionary Government of Zanzibar, 2008).

The Hifadhi ya Misitua ya Asili programme was designed to slow deforestation through poverty reduction, and to reduce greenhouse gas emissions through developing and strengthening the capacity of communities to manage existing forests (Caplow et al., 2014). It involved a collaboration between a local facilitating umbrella NGO (Jumuiya ya Uhifadhi wa Misitua ya Jamii Zanzibar), CARE International, the government's Department of Forestry and Non-Renewable Natural Resources, and a San Francisco-based technical advisor (Terra Global Capital). The principal activities conducted by Hifadhi ya Misitua ya Asili entailed: (1) facilitating registration of Community Forest Management Agreements at the shehia (ward) level (thereby securing land tenure), (2) zoning high protection forested areas within each shehia, (3) supporting Shehia Conservation Committees through education, planting, restoration and the patrol and fining of illegal forest harvesting, and (4) administering trial motivation payments on the basis of shehia performance. Eighteen shehia were invited by CARE, in conjunction with the Department of Forestry, to participate in the programme. Selection criteria included a high per cent of forest cover, rapid rates of deforestation (a mean of 3.3% per annum during 2001–2010 for the 18 shehia initially selected), and free and informed consent. In August 2015 all 18 shehia had their Community Forest Management Agreements formally registered (Plate 1). At this point CARE International withdrew, and the project ended (Royal Norwegian Embassy, 2015), although the application for validation and verification of carbon issuance had not yet cleared the auditing process, a delay resulting



PLATE 1 The celebration for the 18 shehia with registered Community Forest Management Agreements at the close of the Hifadhi ya Misitu ya Asili programme project, attended by the President of the Revolutionary Government of Zanzibar and representatives from the Royal Norwegian Embassy and CARE International (Pemba, August 2015; photo: M. Borgerhoff Mulder).

primarily from high transaction costs associated with the technical complexities of constructing cloud-free satellite images as a forest cover baseline.

Sunderlin et al. (2015) deemed Zanzibar's Hifadhi ya Misitu ya Asili programme defunct but this was premature (see also Blomley et al., 2017). On the one hand, 18 Pemban shehia have formally recognized registered Community Forest Management Agreements, although one is currently ceding its status. Another 10 shehia have elected to enter the process, four await final ministerial signature, and six are in the registration process. On the other hand, there are as yet no carbon payments to communities for their conservation efforts because of continued delay in validation and verification. Despite these problems, most communities are still conducting conservation activities and, with no operational budget, Department of Forestry staff continue to work with them, assisting the Shehia Conservation Committees with management issues, for example.

To date, the outcomes for Pemban communities with Community Forest Management Agreements status are mixed. On the positive side, with their registration titles, shehia have stronger tenure rights to their forests, authority to charge revenue for legal timber use, and clearly defined land-use plans. There are some indications of success, albeit limited. A comparison of baseline rates of deforestation (2001–2010) to recent rates (2010–2018) reveals that of the 18 Pemban shehia with registered Community Forest Management Agreements six have managed to slow their rates of net deforestation during 2010–2018 (Fig. 1, Supplementary Material 2, Supplementary Tables 1 & 2), and two had greater forest cover in 2018 than in 2010. Community members point to the help they receive from the Department of Forestry in managing their forests, particularly with respect to the fining of

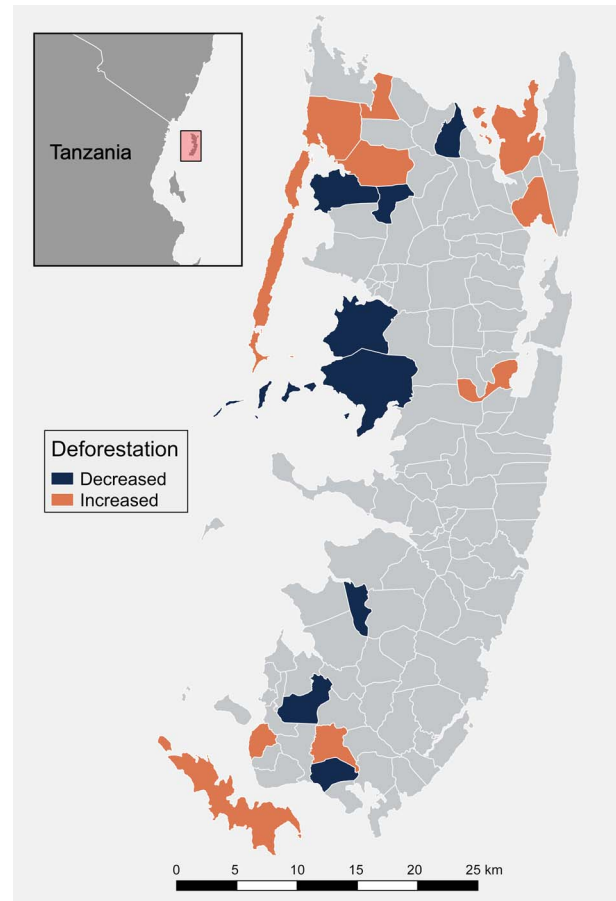


FIG. 1 Pemba, showing the 18 shehia with Community Forest Management, and the annual rate of deforestation in each (from Landsat 5, 7 and 8 imagery) between our historical base (2001–2010) and 2010–2018. Deforestation has decelerated (or reversed) in eight shehia and accelerated in 10 shehia. All details, including source of shape files, are in Supplementary Material 2.

those who steal trees and the removal of corrupt Shehia Conservation Committee members (JA & ASN, unpubl. data). REDD-ready communities have also benefitted from motivation payments that were distributed either as community benefits (health facilities, mosques, madrasa) or as household payments. Furthermore, many shehia now have small-scale enterprise groups who plant firewood lots and sell their produce. Finally, there are now shehia petitioning the Department of Forestry to enter the REDD+ process (the 10 cases mentioned above, and see further details below).

On the negative side, deforestation persists in all but two shehia, and the rate is increasing in 10 shehia (Fig. 1). Although this is perhaps unsurprising given the absence of any financial support since 2014 and of any carbon payments, this indicates that the conservation behaviour promoted by REDD-readiness has not percolated to the majority of shehia that participated in Hifadhi ya Misitu ya Asili. Most palpably, the 'economy of expectations' (Fletcher et al., 2016) looms large. For almost 5 years

TABLE 1 The fate of REDD+ pilot projects in Tanzania. These data are for REDD+ pilot projects supported by the Norwegian Embassy¹.

Location	Communities issued carbon credits	Communities selling carbon credits
Lindi	Yes ²	No ²
Kilwa	No	No ²
Zanzibar	No	No ²
Kilosa	No	No ²
Kondoa	No	No
Kigoma	No	No
Shinyanga	No	No
Rungwe	No	No ²

¹An additional REDD+ project, in Yaeda Valley, is selling carbon credits as of 2019 but was not part of the original Norwegian project.

²Data from personal communication to JBA from May 2017 onwards (also see Simonet et al., 2014), updated using online databases as of March 2019.

communities have been motivated with the promise of carbon payments, yet nothing has materialized and there is marked frustration. Internal conflicts emerge when land zoned for high protection contains clove trees; families now plan to revive clove production, to capitalize on improved market prices. Community members also feel that the government and/or project is failing to provide them with the anticipated financial assistance. Finally, there is a technical disagreement over the calculation of the value of Zanzibar's terrestrial carbon (Ravikumar et al., 2017; Supplementary Material 1). In short, outcomes are mixed. There is only weak evidence of slowing deforestation in some shehia, reductions that cannot be directly linked to the Hifadhi ya Misitu ya Asili programme; furthermore, although the programme yields important co-benefits these cannot substitute for increased carbon storage.

To some extent the experiences of Hifadhi ya Misitu ya Asili mirror those from other Tanzanian REDD+ sites (Table 1), and the broader global situation (Sunderlin et al., 2015; Seymour & Busch, 2016). Most notably none of the Norwegian initiative projects appear to have yet generated carbon payments. The measurement, reporting and verification required for carbon certification demands technical expertise that community-based projects struggle to access (Phelps et al., 2010), leading to long delays, no payments and faltering communication. More specifically, some studies reveal internal conflicts over land zoning as a common occurrence (Larson et al., 2013; Dokken et al., 2014), often exacerbated by corruption and elite capture, as in Unguja (Benjaminsen, 2014; but see Sutta & Silayo, 2014) and elsewhere (e.g. Scheba & Rakotonarivo, 2016), as well as failure to reach desired levels of participation (Eilola et al., 2015). Although there are reports of successful community engagement in some cases (e.g. Uisso et al., 2019), elsewhere disenfranchisement is emphasized (Bartholdson et al., 2019). More generally, REDD+ projects exist within a complicated web of

NGOs, consultants, government agencies, businesses and international bodies. From the perspective of communities living at the forest edge, and the local organizations that act on their behalf, navigating these networks demands daunting levels of human and social capital.

Recommendations for where REDD+ could work

Not all drivers of deforestation are the same

Perhaps the most trenchant critique of REDD+ is that it is unable to counter political and economic interests that stand to gain from the conversion of tropical forests. Examples of these business as usual scenarios are the soy industry in Brazil and oil palm industry in Indonesia, where REDD+ is effectively outbid by commercial profit-seekers. Links between commercial logging companies and government ministers, or between agricultural subsidies and corruption, are a persistent global challenge (e.g. Sills et al., 2014; Capitani et al., 2019).

Nonetheless, situations differ by context. On Pemba the primary drivers of deforestation are local: households extracting fuel and timber, and their expanding agricultural/clove production. Communities also have interests in the fruits and medicines available in the forest, and children hunt forest birds and mammals. Although there is some illegal offtake by government and commercial interests, this is not a significant driver of deforestation in comparison to uses by local communities (Terra Global Capital, 2014; Blomley et al., 2016).

Even the revival of the historically important clove industry (Sheriff, 1987) on Pemba differs structurally from that of large scale business as usual operations. After a slump in the 1990s, clove prices are currently rebounding towards a historical high (Brzoskiewicz, 2018). Although cloves are grown in agroforestry plots and agroforestry is a major source of loss of native forest, there are three factors that mitigate this to some extent. Firstly, cloves are locally-owned, albeit sometimes by affluent families with roots in Oman (reflecting the flight of the wealthiest land-owning class to that country after the 1964 revolution); nevertheless, both local and Oman-based clove-owning families have strong kin ties on the island, and are not equivalent to foreign corporate interests. Secondly, cloves are not grown in conventional plantations, but in an agroforestry matrix. As such, cloves do not pose a landscape-level threat comparable to oil palm or soy mono-cropping. Thirdly, because forests interspersed with clove trees contribute to land considered forested by verification standards (because the woody biomass still holds carbon), there is little opportunity cost for communities attempting to maximize carbon storage as they can benefit simultaneously from cloves and carbon.

In short, Pemba is not a case where REDD+ is challenged by conventional plantation economies or land grabs.

Accordingly we contend that valid critiques of REDD+ as a strategy in Brazil and Indonesia (Brockhaus et al., 2012; Edwards et al., 2012; Henders et al., 2015) are misplaced for a large number of REDD+ projects where forest-dependent communities are struggling to make a living; these communities have interests in protecting their forests from outsiders. In this sense our conclusions align with those of Robinson et al. (2013) for other sites in Tanzania, where key drivers of deforestation are also local extraction of forest products (see also Blomley et al., 2016). In such contexts an approach based on community forestry linked to REDD+ can offer a suite of incentives to reduce deforestation, precisely because its incentives reward those primarily responsible for deforestation.

Centralization is not inevitable

Since its inception, the risk of centralization has loomed over REDD+ (Phelps et al., 2010; Sandbrook et al., 2010). The main concerns are loss of community control over traditional forests (Barr & Sayer, 2012), exclusionary government regulations (Thompson et al., 2011), and elite capture (Andersson et al., 2018). Where these occur, centralized forest management engendered by REDD+ can undercut community management (Brown, 2013). Centralizing tendencies emerge in part because REDD+ is increasingly implemented at a national or jurisdictional level (ostensibly to avoid leakage), and in part because complex carbon accounting, including monitoring, reporting and verification, demands expertise from skilled partners who are generally unavailable locally (Phelps et al., 2010). In addition, the increased commodity value of forests on environmental markets inevitably lures central governments, and/or other investors, to seek rents or land grabs (Sandbrook et al., 2010). Nevertheless, REDD+ projects vary greatly in their scale, degree of centralization and how each programme interacts with government institutions (West, 2016), making such generalizations problematic.

Tanzania has a history of progressive forest management that provides fortuitous institutional pre-adaptations for the development of REDD+ institutions (Burgess et al., 2010; Kweka et al., 2015; Blomley et al., 2016). The Hifadhi ya Misitu ya Asili programme grew out of this tradition, specifically from an earlier (1996–2005) small community forestry project funded by CARE, which focused on conservation and community development in 10 villages around Ngezi forest, the largest remaining area of high forest on the island. Because of these early successes, the Hifadhi ya Misitu ya Asili partners elected to scale up this community management model from the village to the shehia level, and roll it out at the archipelago scale. Thus, the programme was not imposed on a void but rather built onto a history of decentralized forest management with formal government support; conservation committees, albeit of varying skills, reputation and credibility, already existed at some sites.

Some such committees date back to British colonial conservation policies (Supplementary Material 3) and continue to display strong commitments to protecting their forests. Engaging with existing institutions rather than imposing new structures is associated with successful outcomes for community projects (Brooks et al., 2012). In short, with such pre-existing institutions pressures for centralization are less likely to destroy REDD+ programmes.

Quite to the contrary, across Pemba we observe considerable opportunities for complementarities between community management and government oversight. Not only does the fate of government-run forests depend heavily on the activities of Shehia Conservation Committees in neighbouring communities, but members of the Shehia Conservation Committees depend on Department of Forestry personnel to help depersonalize socially costly punishments and fines amongst otherwise tightly-knit communities (Robinson & Lokina, 2012). There is thus a synergy in which both communities and the forest department provision specialized conservation goods that they each have an advantage in producing. This may be a byproduct of an unusually highly community-orientated stance amongst some government personnel (Eilola et al., 2015), but it shows that REDD+ interventions can potentially profit from closer coordination (either spatially or institutionally) with government institutions when there are benefits from specialization.

Leakage can promote conservation adoption

Finally, we note that leakage, typically considered a barrier to sub-national programmes, can be co-opted under specific conditions to drive the spread of community forestry. Leakage is a major problem for any performance-based payments intervention scheme because people and communities can simply shift their environmentally degrading activities to other areas (Atmadja & Verchot, 2012). As elsewhere, leakage occurs on Pemba. Once a REDD+ shehia begins to develop formal institutions to protect its local forest, citizens are potentially incentivized to enter neighboring shehia that do not have such protections, to harvest forest products. This is particularly prevalent given the mosaic structure of the REDD+ shehia (Fig. 1). The result is a growth in the rate of deforestation for adjoining shehia and an increase in competition amongst communities over remaining patches of forest. To reduce leakage, multiple adjoining shehia have begun to petition the Department of Forestry to obtain Community Forest Management Agreements, thereby attaining the legal rights to develop their own institutions to protect their forests from outsiders (Andrews & Borgerhoff Mulder, 2018); this mirrors instances of shehia cooperation seen in Unguja (Eilola et al., 2015). Capitalizing on the shift in opportunity costs created by leakage into adjoining areas allows REDD+ projects to leverage this 'frontier effect' (cf. Turchin, 2003) to promote a cascade

of interest amongst non-participating communities. This means that in places already suffering high offtake from external sources, local people are likely to have high demand for the services that conservation programmes such as REDD+ can offer. Such interest is of course critical to the provision of free and prior informed consent, integral to acquiring Community Forest Management Agreement status.

Conclusion

We propose that generalizations about REDD+ are counterproductive. Instead, and by way of recommendations regarding implementation, we advocate identifying economic, ecological and institutional settings in which REDD+ may be able to deliver its promises. As a team working on Pemba, we believe that many of the currently popular critiques of REDD+ focus on conditions that are not generalizable. Firstly, the threat to community management does not always lie in countering multinational corporate interests in forests: forest-dependent communities can share some goals with advocates of REDD+ with respect to excluding outsiders. Secondly, REDD+ initiatives, when built onto pre-existing decentralized, community-based forestry institutions, will not inevitably fall prey to the predatory whims of centralized government: there are overlooked complementarities between centralized top-down governance and local community management, with each specializing in producing different institutional goods. Finally, there may be unanticipated benefits from the occurrence of leakage that can be harnessed to expand site-specific REDD+ interventions.

We do not downplay the challenges facing incipient REDD+ projects, nor suggest that conditional payments are a panacea for success or that REDD+ in Pemba is, or will ever be, a success. But we do contend that dismissals of REDD+ as a doomed conservation fad fail to appreciate the diversity of programmes and actors, and the great amount of institutional learning that has taken place in this process.

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Conflicts of interest Jumuiya ya Uhifadhi wa Misitu ya Jamii Zanzibar is the implementing NGO, but all authors are motivated to

improve the chances of REDD+ being implemented on Zanzibar for the reasons argued herein.

Ethical standards This research was conducted with permission of the Revolutionary Government of Zanzibar. Ethical clearance was granted by University of California Davis Institutional Review Board ID991486 to MBM for 'Community-Based Forest Conservation under REDD in Pemba, Zanzibar', and the research otherwise abided by the *Oryx* guidelines on ethical standards.

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