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Linking Social Businesses, Biodiversity Conservation, Carbon Sequestration, Sustainable Livelihoods, and Community-Managed Indigenous Forests in Zimbabwe

Joe Muzurura
Midlands State University, Faculty of Business Science, Economics Department of Economics, Zimbabwe,
muzururaj@staff.msu.ac.zw

Abstract

In addition to their timber value, community-managed forests have many non-timber benefits. There are efficient carbon sequesters that sustain higher biodiversity conservation when compared to mono exotic forests. Harnessing community-managed native forests and social businesses could also be an important channel for improving rural communities' livelihoods. The main purpose of this paper was to explain the linkages among social business, biodiversity conservation, carbon sequestration, and sustainable livelihoods for communities that subsist on mixed indigenous forests. A structured focus group was employed to collect qualitative data from twenty-three participants who were selected using purposive sampling. Our findings demonstrate that yoking social business with community-managed mixed indigenous forests could be a remedy not only for reducing the impact of climate change on marginalised rural communities, but also for reducing poverty and food insecurity. Social businesses are encouraged to provide rural communities with advanced forest management skills to optimise carbon sequestration and biodiversity conservation. Improving access to green financing instruments such as carbon credits may assist marginalised rural communities in broadening their revenue streams, at the same time enhancing livelihood resilience against climate change.

Keywords: Biodiversity Conservation, Carbon Sequestration, Rural Livelihoods, Indigenous, Forests, Social Businesses, Zimbabwe

Abstrak

Selain nilai kayunya, hutan yang diuruskan oleh komuniti menawarkan pelbagai manfaat bukan berasaskan kayu. Hutan ini berfungsi sebagai penyerap karbon yang lebih berkesan serta menyokong tahap pemuliharaan biodiversiti yang lebih tinggi berbanding hutan monokultur eksotik. Pemanfaatan hutan pribumi yang diuruskan oleh komuniti, bersama-sama perniagaan *sosial, berpotensi menjadi saluran penting untuk meningkatkan mata pencarian masyarakat luar bandar. Tujuan utama makalah ini adalah untuk menjelaskan hubungan antara perniagaan sosial, pemuliharaan biodiversiti, penyerapan karbon dan mata pencarian lestari bagi komuniti yang bergantung kepada hutan pribumi campuran. Perbincangan kumpulan berfokus berstruktur digunakan untuk mengumpul data kualitatif daripada dua puluh tiga orang peserta yang dipilih melalui persampelan bertujuan. Dapatan kajian menunjukkan bahawa pengintegrasian perniagaan sosial dengan pengurusan hutan pribumi campuran oleh komuniti mampu menjadi penyelesaian bukan sahaja untuk mengurangkan kesan perubahan iklim terhadap komuniti luar bandar yang terpinggir, malah turut berperanan dalam mengurangkan kemiskinan dan ketidakjaminan makanan. Perniagaan sosial digalakkan untuk membekalkan komuniti luar bandar dengan kemahiran pengurusan hutan yang lebih maju bagi mengoptimumkan penyerapan karbon dan pemuliharaan biodiversiti. Di samping itu, penambahbaikan akses kepada instrumen pembiayaan hijau seperti kredit karbon berpotensi membantu komuniti terpinggir mempelbagaikan sumber pendapatan mereka, sekali gus meningkatkan daya tahan mata pencarian terhadap perubahan iklim.*

Introduction and Background

In many developing economies, social businesses' support for community-managed native forest, also known as indigenous forests, has become a major tributary not only for attaining sustainable livelihoods but also for strengthening the resilience of marginalised communities against the negative effects of climate change. According to Yunus (2010), social businesses are different from charity organisations in that they do not encourage dependency among the served, but aim at making those being served active participants in the economy. Social businesses assist in providing remedies to many challenges that face marginalised rural communities living in most developing countries. These challenges include a wide range of social and environmental problems such as socio-economic exclusion, inequalities, poverty and hunger, deforestation, climate change, carbon footprint, and access to health and education. We define social businesses as hybrid organisations that seek not only to maximise shareholder wealth, but also to pursue social, financial, and natural environmental protection goals.

Most rural communities in Zimbabwe derive their subsistence from community-managed indigenous forests.

Harnessing social businesses in conserving the biodiversity of these trees may promote more carbon sequestration, and could be a practical tool for reducing poverty, food insecurity, and creating employment in rural communities. Notwithstanding their timber extraction value, indigenous trees are also key in the traditional food security value-chain system of many community-managed forests. Many indigenous trees provide non-timber co-benefits such as providing clean air and water (Dolch et al., 2016; de Almeida et al., 2020; Hu et al., 2020), help to control soil erosion (Estrada-Villegas et al., 2019; Cuenca et al., 2018), offer recreational and aesthetic amenities, including traditional medicine (De Vitis et al., 2020; Crouzeilles et al., 2020), and improve livelihoods by contributing to food security (Steur et al., 2020; Liu et al., 2020). In addition, most native forests have wilderness existence value that appeals to tourists seeking spiritual healing or interested in bird watching, hunting, and forest-based cultural experiences (Mutambara et al., 2022). More significantly, many studies also show a positive correlation among sustainable-community-managed forests, economic growth, and national development (Asbeck et al., 2021; Bhardwaj et al., 2021; Tolangay and Moktan, 2020; Oldekop et al., 2019; Wyse and Dickie, 2018). Fagan et al., 2020; Deere et al., 2020).

Many studies also report that most mixed indigenous forests efficiently store more long-lived stock and flow of carbon pollutants than mono exotic plantations, and if properly managed, have a strong potential to offer substantial mitigation against climate change and global warming (Asbeck et al., 2021; Bhardwaj et al., 2021; Wyse and Dickie, 2018; Hu et al., 2020). Like many Sub-Saharan Africa countries, Zimbabwe has not been spared from the adversative impacts of climate change and global warming such as; lengthening of crop growing seasons, early tree flowering (Asbeck et al., 2021; Bhardwaj et al., 2021), reduced clean water availability and/or exposure to extreme overlapping flooding and droughts (de Almeida et al., 2020; Hu et al., 2020), reduction in the quality of crop and fruit yields (Kaushal and Baishya, 2021; Hong et al., 2020; Höhl et al., 2020), and sudden upsurges in the population of rural people exposed to vector-borne diseases like malaria and cholera (Schleussner et al., 2016; Huang et al., 2020; Hu et al., 2020).

In more recent years, many community-managed indigenous forests in Zimbabwe have been increasingly subjected to severe anthropogenic interference, leading to lower carbon sequestration and loss of biodiversity. For instance, rapid urbanisation has forced the country to switch land use from indigenous forests to either residential, industrial, or agricultural uses. Consequently, the harmful effects of extreme climate change, such as erratic rainfall patterns and frequent droughts, have often fallen disproportionately on marginalised rural people, especially women and children. Hu et al (2020) report that, unlike men, women and children have a constrained adaptive capacity to deal with the effects of climate change. If social businesses are properly harnessed as sanctuaries for creating environmental social value, they could play a critical role in assisting the preservation of community-managed indigenous forests.

At the international level, Zimbabwe is a signatory to various multilateral agreements that include the Kyoto Protocol, the Paris Agreement, the Montreal Protocol, the United Nations Conventions to Combat Desertification, the United Nations Convention on Biological Diversity, and the Convention on the International Trade in Endangered Species of wild flora and fauna. Of noteworthy, in 1992, Zimbabwe became one of the first countries to ratify the United Nations Framework Convention on Climate Change (UNFCCC), whose main objective is stabilising greenhouse gas emission concentrations to a level that would prevent anthropogenic interference with the climatic system, within a time period which allows ecosystems to adapt naturally and enables sustainable development in the atmosphere. At the national level, in 2019, Zimbabwe formulated the National Climate Policy, whose objective is to influence the adoption of agroecology as an adaptation and mitigation solution against the impacts of climate change and global warming.

Despite being a state party to many international and regional bodies that deal with deforestation, climate change, and global warming, the country has failed to situate social businesses in national climate mitigation strategies, practices, and policies. In fact, the potential role of social businesses in assisting communities that subsist on indigenous forests has also been overlooked or ignored by the country's natural environment conservation policies. The country's national conservation policy, for instance, favours commercial forest enterprises that are primarily driven by profit maximisation motives at the expense of social value. As a result, large swathes of depleted community-managed indigenous forests have either been reforested with fast-growing mono-exotic forests or put to different use. However, it is widely acknowledged in empirical literature that most indigenous trees tend to sustain higher species diversity and sequester more carbon than exotic plantations (Das et al., 2021; Mattana et al., 2020; Friggens et al., 2020; Crouzeillej et al., 2016; Kaushal and

Baishya, 2021; Dar et al., 2019; Hoque et al., 2020). A total of 40% of Zimbabwe's total land is occupied by forests, of which 15.624.000 hectares of the forests are native trees, whilst 153.000 hectares are covered by plantations (Food and Agriculture Organisation (FAO), 2020; Government of Zimbabwe (GoZ), 2023). At least 5.1% or about 801.000 hectares are categorised as primary forest, which is the most biodiverse and carbon-dense form of indigenous forests. The most common indigenous trees in Zimbabwe include the dry miombo woodlands, the Baikiaea plurijuga, the acacia and colophospermum mopane, and Combretum terminalia (GoZ, 2022). Even more worrying, whilst most indigenous trees have a huge potential for sequestering more carbon due to their extensive support of biodiversity conservation, they are also prone to overexploitation, unplanned deforestation, and frequent changes in land use, especially from forestry to agricultural, manufacturing, and artisanal mining activities. Furthermore, unlike exotic trees, most indigenous trees have lower regeneration and growth rates. The GoZ (2020) estimates that most indigenous trees can take upwards of 100 years to reach full maturity.

The problem of deforestation is extensive in most indigenous forests. For instance, between 1990 and 2020, the country lost over 33.000 hectares or 60.000.000 native trees annually (GoZ, 2022). Out of the total 15.62 million hectares, forest cover is expected to decrease to 6.189 million hectares by 2030 based on an average deforestation rate of 312.000 hectares per annum (GoZ, 2022). Most indigenous forests are lost to wildfires, household uses like energy supply and food, brickmaking, and wood carving. An estimated 0.6% of Zimbabwe's native forests are lost also to agricultural expansion, particularly to tobacco curing and production of charcoal (GoZ). In 2023 only, the country could have lost an estimated 9.050.000 hectares of indigenous forests and an equivalent of 3.82 metric tonnes of CO_2 emission (FAO, 2022). At least 10% of Colophospermum mopane trees that are renowned for higher biomasses are damaged during the harvesting of Mopane worms (Gonimbrasia belina) (Kwiri et al., 2020; Musundire et al., 2021). The GoZ (2020) estimates that the country requires at least US$55 billion to reduce greenhouse emissions by 33%. This amount is huge given that the country is also saddled with a high public debt overhang of US$18.8 billion.

According to Shirima et al (2011), Zimbabwe's indigenous trees store an estimated 23 Mg ha-1, hence making them a significant carbon store. More carbon sink increases the availability of freshwater (Tolangay and Moktan, 2020; Hoque et al., 2021; Das et al., 2021). In contrast, deforestation of indigenous trees causes huge latitudinal and elevated shift of biomasses (Asbeck et al., 2021; Crane, 2020; Estrada-Villegas et al., 2019), which in turn increases food insecurity in developing countries (Schleussner et al., 2016; Huang et al., 2020; Hu et al., 2020; Kohl et al., 2020; Maxwell et al., 2019). Hence, the importance of coming up with strategies that optimise carbon sequestration and biodiversity conservation in community-managed forests as a strategy not only for fighting global warming, but also to improve the resilience of marginalised rural communities. This is because carbon sequestration affects carbon and nitrogen cycles that are key to the mitigation of climatic changes and global warming (Annos et al., 2019; Estrada-Villegas et al., 2019; Cuenca et al., 2018; Gardon et al., 2020; Fofana et al., 2020; et al Höhl et al., 2020). The country has been increasingly exposed to severe and erratic weather patterns characterised by intermittent cyclical droughts and shifting periods of rainy seasons. In fact, extreme weather patterns associated with El Niño effects have increased in their frequency, duration, and intensity. The main objective of the research was to examine the role of social businesses in promoting carbon sink and biodiversity conservation in community-managed forests. The ancillary objective was to explore strategies on how social businesses can enhance the resilience of rural communities that live near and manage indigenous forests.

The study is important for several reasons. First, natural climate solutions and strategies, especially those that rope in social businesses, may be a more sustainable way of promoting biodiversity conservation and reforestation of community-managed forests. Second, indigenous trees produce large biomass that has many social-value benefits, such as increasing ecosystem structure, improving biodiversity conservation, strengthening wildlife protection, enhancing water catchment, preventing soil erosion, and increasing soil moisture holding capacity. Simultaneously coupling ecological and social concepts, also known as agroecology, in the design and management of sustainable agriculture and food systems may help rural communities that manage indigenous forests to arrest hunger and poverty, and also create employment. Third, in many developed economies, there is high adoption of carbon financing instruments such as carbon credits and green bonds in managing the natural environment (Erbaugh and Oldekop, 2018; Hell and Brancalion, 2020; Gann et al., 2019; Crane, 2020; Liu et al., 2020). Yet, Zimbabwe is lagging behind in using green finance instruments despite the potential of community-managed indigenous forests to uplift the livelihoods of rural communities. Fourth, the interconnectedness of social businesses, biodiversity conservation, carbon sequestration, and community livelihoods has been well ventilated in the literature. However, in Zimbabwe there is a lacuna of empirical literature that focus on this important linkage. And hence, this study. The rest of the study is organised as follows. The first section covers the introduction and background. Literature review is presented in section two. The third section covers the methodology whilst the fourth and fifth sections present research findings, discussions and policy implications respectively.

Literature Review

Carbon sequestration is a complex issue covering various issues in the biophysical environment (Mattana et al., 2020; Arroyo-Rodríguez et al., 2017). The term carbon sequestration is often used to describe the acquisition and storage of carbon in order to reduce the impact of carbon emissions in the atmosphere (FAO, 2020; Siegner et al., 2021; Das et al., 2021; Asbeck et al., 2021). When compared to pasture systems or single-species crops, forest systems are reported to have a higher potential to sequester more carbon (FAO, 2020; Kaushal and Baishya, 2021; Hong et al., 2020; Höhl et al., 2020; Deere et al., 2020). This is because forest systems capture and utilise light, nutrients and water more efficiently than pastures (Bloomfield et al., 2019; Erinos et al., 2019). Mature indigenous trees are major long-term carbon stores due to their complex structure, hardwood nature of trees, and stronger resilience to flooding, droughts, and wildfires (Seddon et al, 2019; Maxwell, 2018).

In indigenous forests, carbon sequestration can also be combined with soil-based remedies to prevent carbon emissions and remove atmospheric carbon dioxide (Das et al., 2018; Chu et al., 2017; De Vitis et al., 2020; Crouzeilles et al., 2020) and the public sector (Chu et al., 2017). Trees help to conserve soil, water quality, and provide recreation (Lewis et al., 2019; Molin et al., 2019). Trees provide people with invaluable products and services such as food, medicine, building materials (Brancalion and Holl, 2020; Diaz et al., 2016; Cuenca et al., 2018; Bannister et al., 2016), fibre, recreation space, seed dispersers and pollution filtration (Chaisdon and Uriate, 2016; Chomba et al., 2016; Molin et al., 2019), reduce flood risks (de Souza et al., 2016; Fagan et al., 2020; Hu et al., 2020) are important reservoirs of carbon (Bond et al., 2019; Boissiere et al., 2017; Bellard et al., 2016), water and nutrients (Douwes and Buthelezi, 2016; Feng et al., 2016; Das et al., 2018). Displacement of native forests has unintended consequences particularly the reduction of pollination services (Hong et al., 2020; Heilmayr et al., 2020; Brancalion et al., 2018), disruption of water cycles and decrease in carbon stored in above-ground biomass (Reid et al., 2019), lowering of albedo in boreal zones, and inducing temperature rises (Kull et al., 2019; Rozendaal et al., 2019; Domke et al., 2020).

According to Kildisheva et al (2020), extensive use of exotic monoculture plantations instead of promoting a diverse and carbon-rich mix of community-managed indigenous forests has serious implications for food security and sustainability. The reason being that monoculture plantations discourage optimum carbon sequestration due to early harvesting (Hu et al., 2020; Crane, 2020; Hu et al., 2020), decelerate biodiversity growth and recovery (Parsa et al., 2019), and may hinder sustainable communal livelihoods through lower non-timber and social value (Heilmayr et al., 2020; Brancalion et al., 2020; Pedrini et al., 2020; Kildisheva et al., 2020; Fofana et al., 2020). Unlike commercial forest enterprises, social businesses are largely motivated by ethical issues, governance and environment and hence, their suitability in protecting natural environment (Liu et al., 2020). Indeed, many studies also demonstrate that the loss of indigenous forests are not easily compensated by reforestation strategies the use exotic trees in spite of short growing season (Oldekop et al., 2019; Pedrini et al., 2020; Seddon et al., 2019; Ennos et al., 2019; Wyse and Dickie, 2018). In many countries, community forest enterprises have been promoted as a means by which to deliver social, environmental, and financial benefits to forest-based communities (Pedrini et al., 2020). However, their major shortcoming is that in pursuit of profit maximisation goals, the need to protect the natural environment is seriously compromised. In contrast, social businesses go beyond commercial forest enterprises by helping rural communities to address problems of poverty, food insecurity, deforestation, social marginalisation, and environmental degradation (Perino et al., 2019). However, the contribution of social businesses could be impactful if natural environmental laws (Frigesens et al., 2020; Perino et al., 2019; Mollin et al., 2018)

Methodology

The researchers conducted one focus group discussion to collect qualitative data. The advantage of using a focus group discussion was that the researcher was able to investigate the ways in which various individuals collectively made sense about the benefits of community-managed forests. As shown in Table 1, the composition of the focus group was stratified according to forest management knowledge and responsibilities, local social businesses, expertise and specialised forest skills, and being a local resident. The focus group had four objectives. The first objective was to solicit perspectives about how to better manage community-managed native forests for the benefit of local communities. Second, to explore strategies that can be used to optimise carbon sequestration and biodiversity conservation in community-managed native forests in order to promote sustainable livelihoods. Third, to explore whether it was feasible to reforest some depleted areas of indigenous forest with exotic forests. Fourth, to examine how social business can help community-managed forests to improve biodiversity conservation, carbon sequestration, and livelihood resilience.

The focus group discussion was also held under the assumption that the community experiences would be different in particular local environments and socio-economic contexts. Whilst it is accepted that focus group discussions cannot aim to be truly representative of the total population living in the three wards, the researchers ensured the results could be deemed illustrative of the possible ward variation and therefore, able to provide a limited generalisability. In this regard, the participants for the focus group discussion were chosen using a purposive sampling technique. Participants were selected using criteria like: knowledgeable about environmental conservation of indigenous trees, direct beneficiaries of these forests, managers of local social businesses, botanists, ecologists, or environmental economists. Although a discussion script was employed, the researcher developed a relatively unstructured approach to asking questions that was in keeping with the broad nature of the study under consideration. The discussion used a combination of vernacular languages and English, and notes were taken by the researcher who later converted the notes into a codebook summarising the main topics discussed and participants' views.

Table 1: Location and Attendees of Focus Group Discussions

Name of ward	Number of attendees	Reason for selection
Ward 21 of Guruve District	5	Beneficiaries of forests
Ward 22 of Guruve District	5	Beneficiaries of forests
Ward 23 Guruve District	5	Headman, beneficiaries
Key experts	8	2 Botanical experts; 2x ecologists, 3x environmentalists,

Discussions And Findings

The Role of Social Business in Community-Managed Forests

It was found that social businesses can play a significant role in fostering the socio-economic development of communities that depend on indigenous forests. In particular, most beneficiaries suggested that social businesses can assist in providing the essential expertise, forest management skills, reforestation strategies, and how to mobilise revenues using carbon credits. This suggestion was of particular interest as it was very clear from the group discussions that most local people involved with the management of community-managed indigenous forests were not even aware of how carbon credits and green bonds could assist these communities to derive and diversify their sources of revenue. This was after it was reported that most community-managed indigenous forests were largely used for their direct timber value and non-timber benefits, such as a source of fuel, fibre, and traditional medicine, food, and rainmaking activities. A biologist reported that community-managed forests were useful in providing watershed protection, soil erosion control, and recreational, educational, cultural, and spiritual benefits. It was also demonstrated by two ecologists that carbon sequestration in Munanaire forest is potentially 50 times greater than in monoculture plantations. These findings are also supported by a number of studies, for example, Lewis et al (2019) and Molin et al (2018).

Reforesting Depleted Areas of Community-managed indigenous Forest

Regarding reforesting some sections of depleted community-managed indigenous forests, most participants, especially ecologists and environmental economists, were all in agreement that reforesting these forests with either indigenous trees or some form of monoculture small plantation can help rural communities to achieve multiple goals like mitigation of climate change, biodiversity conservation, food security, economic growth, and national development. It was added by botanists and some direct beneficiaries of community-managed forests that rather than being an end goal in itself, situating some form of exotic monoculture plantation within community-managed forests could also serve manifold objectives like climate-change mitigation, soil and hydrological stability as well as providing socio-economic benefits like improving resilience against drought and floods, creating employment for youth and women, and improving biodiversity.

These findings have confirmation in the literature; mixing indigenous and exotic forests has the potential to support high species and functional trait diversity that, in turn, enhances ecosystem resilience and improves forest productivity (Kull et al., 2019; Besseau et al., 2018; Rozendaal et al., 2019; Philpson et al., 2020). However, some beneficiaries preferred reforestation with native or exotic trees. Two participants were in favour of reforesting depleted areas of indigenous trees with exotic trees for reasons that exotic trees mature early and have a high revenue turnover compared with native forests, hence allowing revenue diversification. Their views are not supported by some studies that argue that decisions to reforest parts of native trees with exotic ones must only be made by combining ecological, historical, cultural, and socio-economic factors at different spatial scales (Friggens et al., 2020; Dass et al., 2018; Crane, 2020; Lewis et al., 2019); Chazdon and Brancalion, 2019).

Optimising Carbon Sequestration and Biodiversity Conservation

One botanist argued that whilst monocultures of fast-growing plantations are used in other countries, in the long term, indigenous forests maximise biomass and sink more carbon while conserving resilient biodiversity. It was also suggested by local headmen that, from traditional experiences, indigenous trees have an inadequate seed supply that is also difficult to store due to their sensitivity to desiccation. However, a serious concern also raised by many beneficiaries was that some exotic species have the potential to become invasive and thus may have disastrous effects on strategies to improve natural habitat, biodiversity conservation, land degradation, and therefore, may lead to sub-optimisation of carbon stores in these forests. These findings are not entirely supported in the literature. A number of studies demonstrate that mixing forest species improves the capacity to conserve biodiversity, attract seed pollinators and dispersers, and thus the optimisation of carbon sequestration (Dvderski and Jagodzinski, 2020; Crouzeilles et al., 2020; Holl and Brancalion, 2020; Horak et al., 2019). In fact, Horak et al (2019) aver that if patches of exotic forests are maintained within the plantation of native forest, such forests will not only regenerate autonomously but will become more resilient to fire, diseases, and extreme droughts.

Recommendations and Implications

Despite their significant contribution to carbon sink and biodiversity, most indigenous trees take time to mature and are difficult to reforest, and therefore, the study recommends promoting some naturalist interactions that involve reforesting the depleted portion of indigenous tree species with some monoculture plantations, and introducing some seed-dispersing animals, fungi, and pollinators to achieve a resilient and biodiverse ecosystem in community-managed forests. In this regard, social businesses can assist rural communities that subsist on indigenous forests to mobilise funding for some of these initiatives. Social businesses are also recommended to scale up non-timber value activities in community-managed indigenous forests, such as bee-keeping, rearing of wild animals, growing of wild mushrooms, handcrafting, and other agroecological activities. These activities reduce the demand for timber from indigenous trees whilst simultaneously arresting deforestation.

Developing sustainable and diverse income streams for forest-dependent communities

For community-managed native forests to be sustainable, the income streams generated by the forests must exceed those obtained from both timber and non-timber value. Hence, social business can assist native forest-dependent communities by developing sustainable income streams. The findings show that most communities that depend on indigenous forests are not aware of carbon credits, green bonds, and other forms of green financing. Therefore, the recommendation for social businesses is to assist these communities to broaden revenue streams through promoting cultural and ecotourism, providing marketable watershed services, and facilitating access to carbon credits and green financing in international markets. Social business should also help to create a missing market for non-timber forest products such as fruits, fungi, mushrooms, nuts, fibres, ornamental and medicinal plants, mosses, resins, gums, syrup, game meat, and honey. These, in turn, can help to increase the livelihood resilience of the forest-based communities against food insecurity, poverty, and unemployment. Locals should be trained

Replanting Depleted Areas with Seedlings that have appropriate Genetic Variability and Provenance

Large sections of the community-managed indigenous forests have been lost to anthropogenic activities, mainly fuel-wood, agricultural, and residential expansion. In this regard, social business can help by providing rural communities with knowledge of vegetative propagation mechanisms. They can also assist local people with seeds with higher genetic diversity consistent with local genetic variation. This may help to regenerate indigenous trees that are resilient to diseases, inbreeding depression, and the effects of flooding and wildfires. Training rural communities on phenological monitoring regarding abiotic and biotic factors, as well as seed physiology and morphology, can help accelerate the afforestation of depleted areas. Social businesses may help to provide linkages with commercial forest enterprises, as well as experts like botanists and ecologists, to enable local communities to construct low-cost seed-storage facilities and seed banks for use in times of need. This is because most seeds of indigenous trees have dissimilar dormancy mechanisms that may require specific conditions for germination. Traditional knowledge of locals who have resided and benefited from community-managed forests should be harnessed for the training of younger generations. This may also enable the building and preservation of indigenous forest knowledge systems, as well as the protection of local cultures.

Green Financing and Carbon Credits

The value of carbon often exceeds revenues from the main drivers of deforestation in community-managed forests, such as timber value. Therefore, monetising community-managed forests as carbon sinks ensures that rural communities have direct access to carbon markets. Social business can also provide low-interest start-up loans to enable community-managed forests to be transformed to viable forest commercial-enterprises. In addition, social business may also provide cheap loans to forest-dependent rural communities to enhance resilience and adaptation during periods of unplanned destruction of forests, either by wildfires or floods. Whilst harvesting rates of returns of monoculture plantations are reasonably high compared to community-managed indigenous forests, social business could help to smooth variabilities of market prices of fuel-wood by helping to influence international prices of hard timber produced by indigenous trees.

Adopting Innovative Marketing skills for Non-Timber benefits of Indigenous Trees

The findings show that most local people are not aware of or unfamiliar with the marketing of ecotourism and other services that help to directly monetise biodiversity. Providing substantial start-up funding that enables rural communities to build and support eco-tourism initiatives is imperative. Social business can also assist rural communities by monitoring that payments received from ecotourism actually benefit local communities. Promoting partnerships that include multiple stakeholders, such as government, forest scientists, chiefs, community leaders, and social businesses, is likely to lead to enduring long-term benefits for rural communities. Optimising carbon sequestration and biodiversity conservation may require overcoming socio-economic-political and cultural barriers, as well as good governance of natural resources.

Therefore, we recommend that the government address land tenure concerns, carbon fixation, and watershed protection that pose significant constraints to rural communities. Facilitating export promotion and simplifying bureaucratic requirements on the processing of foreign products, especially game meat, is a key recommendation. Other promising options that enhance the marketing of indigenous forest products are the need to adopt green and social purchasing policies. In this regard, strategic alliances with social businesses, downstream buyers, and processors can increase returns of community-managed forests through a risk/benefit sharing mechanism and also reduce transaction costs.

Conclusions

In many developing economies, Zimbabwe included, social businesses' support for community-managed native forests has become crucial not only for enhancing biodiversity conservation, optimising and maintaining carbon sinks, but for increasing livelihood resilience for rural communities that live near indigenous forests. The main purpose of the study was to examine how social business can help biodiversity conservation, carbon sequestration, and improved livelihoods in community-managed native trees. The main findings demonstrate that if properly yoked with community-managed forests, social business can help to diversify incomes coming from non-timber products. Adopting green financing instruments could be one way to diversify revenue streams and reduce the over-dependence on the timber value of indigenous forests.

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