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Forestry Policy, Conservation Activities, and Ecosystem Services in the Remote Misuku Hills of Malawi

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Abstract: Research Highlights: Most of Malawi's land area has been deforested; however, expansive indigenous forests remain in the remote Misuku Hills in Malawi's northern region. Despite its conservation potential, this region of Malawi has been overlooked in forestry conservation research. Background and Objectives: The Misuku Hills is one the most floristically diverse regions in Malawi, but this region is facing similar pressures and forestry policy enforcement challenges that drive deforestation of other regions. This study therefore addresses the questions: What are the forestry policy challenges and opportunities for forest conservation in Malawi? What conservation activities are taking place in the Misuku Hills in support of these policies? What ecosystem services are residents using that are in need of protection? Materials and Methods: A comprehensive inventory and review of the national forest policies and current programs in the Misuku Hills region was compiled through document reviews and communications with governmental and non-governmental stakeholders. A Photovoice exercise was conducted with residents of Chikutu village to create an inventory of resident-identified ecosystem services. Results: While there is an impressive array of policies in place to protect the forests of Malawi, there is little institutionalization or enforcement of these policies. There have been funded conservation programs in the Misuku Hills, but these have been limited to the areas surrounding the three small public forest reserves. The Photovoice exercise revealed that residents rely on an abundance of forest ecosystem services to support their livelihoods, including food, medicine, and timber products. Conclusions: The challenges to conserving forests and their ecosystem services are being met at a local level in a variety of creative ways in the Misuku Hills (e.g., tree planting, beekeeping) that could be used as community-based models for other areas in Africa and elsewhere, where people depend directly on these services to meet daily needs.

Keywords: forests; environment; Malawi; ecosystem services; Photovoice; conservation; policy; community-based forest management; participatory forest management

1. Introduction

1.1. Rates of Deforestation in Malawi

Deforestation rates in the tropics are increasing after a promising lag supported by conservation efforts and good governance measures during the 1990s and early 2000s [1]. Increased deforestation is particularly concerning in Africa, where land is rapidly converted to support growing populations and expansion of small-scale and subsistence agriculture [2–4]. In the southeast African nation of Malawi, concerns are growing around the preservation of forest resources, the livelihoods dependent on these resources, and the dynamics which threaten their viability. The most methodologically forthcoming

and rigorous estimate available of the forested land area in Malawi reveals that 26.8% of this small African country is forested (Figure 1), and Malawi experienced a 1.6% aggregated loss of tree cover between 1990 and 2010 (1.4% 1990–2000; 0.2% 2000–2010) [5]. The 1.6% total forest loss over this 20-year period is almost completely explained by the equivalent expansion of agricultural land [5]. Most of the agricultural expansion in Malawi has happened on customary land (defined below), outside the jurisdiction of government-controlled parks and reserves [6].

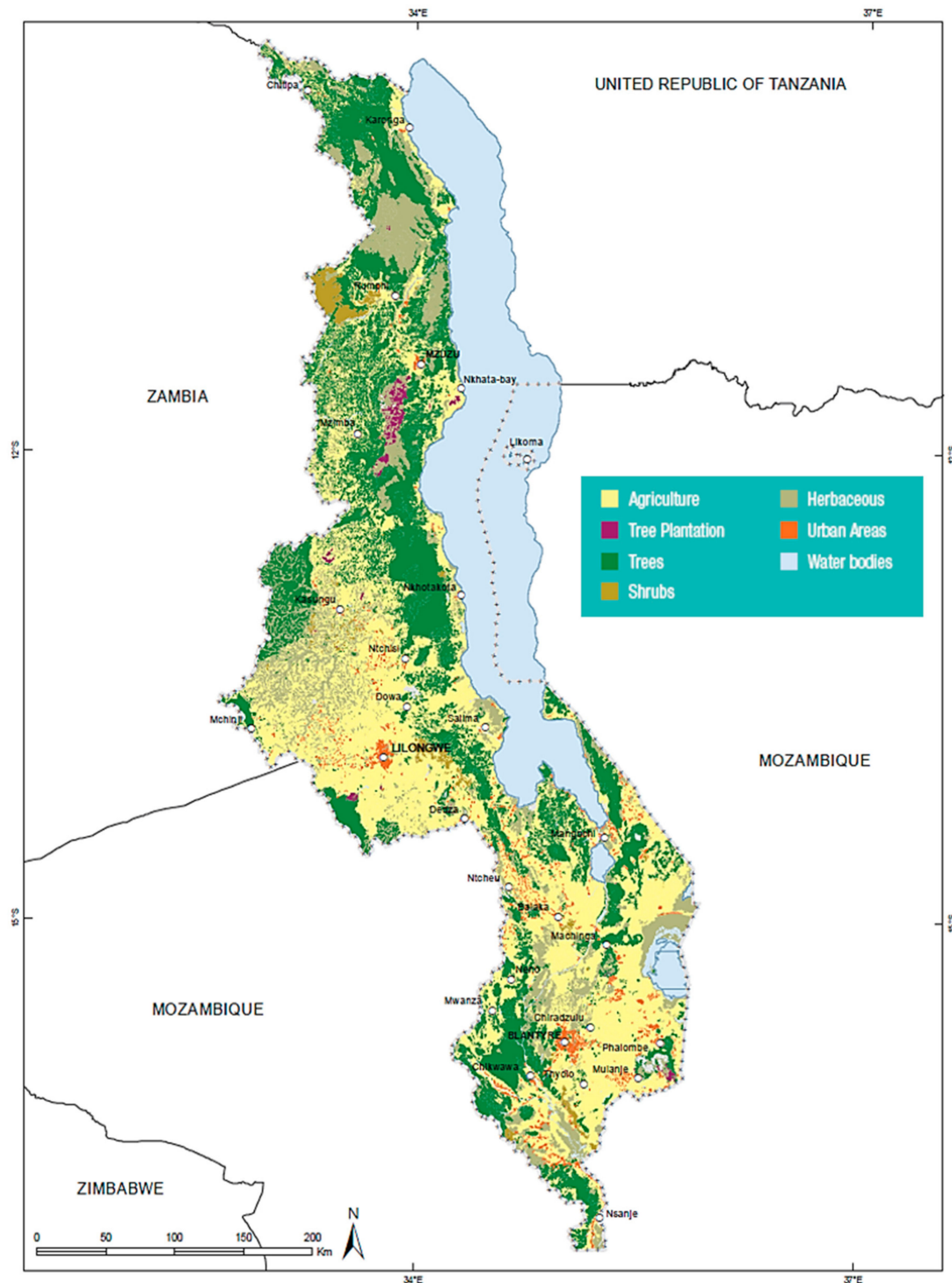


Figure 1. Vegetation map of Malawi. Source: Adapted from FAO (2013).

There are many conflicting estimates of Malawi's forest cover, land tenure regimes in forested areas, and overall deforestation rates. These discrepancies and their potential implications are presented in Appendix A. The deforestation rates above are much less grave than other widely cited estimates. Nonetheless, deforestation continues and the persistent drivers of deforestation provide reason to believe that its consequences will continue to threaten the livelihoods of Malawians who are heavily dependent on forest ecosystem services [7].

The available estimates for the land tenure of forested areas indicate a nearly equal distribution in national parks and game reserves, forest reserves, and on customary land [6,8]. National parks, game reserves, and forest reserves are public, government-controlled lands. Customary land is under Tradition Authority, an indigenous geo-political and socio-economic jurisdiction with customary sovereignty under authority of a Chief [9]. Essentially, all land that is not public or privately owned is customary, and customary land accounts for approximately 85% of the total land area in Malawi [10].

1.2. Drivers of Deforestation

The main drivers of deforestation in Malawi are a rapidly growing and extremely poor population converting forested land to support small-scale subsistence agriculture for food provisioning and income [11] and using wood as a primary energy source.

First, population. The total population of Malawi grew by 35% between 2008 (13,029,498) and 2018 (17,563,749). While this may seem startling, the gross increase in population equates to a current population density of 186 persons/km² in this comparatively small African country [12]. There are inconsistencies in various country rankings of population density, but 186 persons/km² currently places Malawi at approximately the 75th most densely populated country in the world, still far less dense than other small African countries (e.g., Rwanda, Burundi, The Gambia), but also less dense than some comparatively larger African countries (e.g., Nigeria, Uganda). A major difference between Malawi is that 84% of the population resides in rural areas, making Malawi one of the least urbanized countries in Africa [12,13]. The population is dispersed, placing greater pressures on the entirety of the landscape. Population density in Malawi has been shown to be a significant socio-economic explanatory variable of deforestation in Malawi [14], and population growth is a perceived underlying driver of land use and land cover change in Malawi [15].

Second, agriculture. Malawi's economy and the livelihood of Malawians are heavily dependent on agriculture, which "accounts for about 36% of the Gross Domestic Product (GDP), 87% of the total employment, and supplies more than 65% of the manufacturing sector's raw materials" [13] (p. 4). A 2009 report estimates an expansion of agriculture by 31% between 1975 and 1990, with the majority of expansion coming through the clearing of indigenous forest and woodlands. The report attributes these changes to the need to feed a rapidly growing population and desires to promote economic growth through expansion of agriculture production [7]. Indigenous forests on customary land have been the main source of additional agricultural land [16]. The overwhelmingly rural population derives its livelihood from small land holdings of 0.5–2 ha per household, but it is not agriculture on these small landholdings per se that is the threat to forests, but rather "poor husbandry techniques in the absence of alternative economic opportunities" [7] (Preface).

Third, poverty. Poverty is a critical and compounding factor which exacerbates the pressures of a growing population primarily dependent on subsistence agriculture. Malawi is the second poorest country in the world, as measured by annual per capita income [17]. A lack of income-generating opportunities leads many Malawians to extract natural resources directly from the immediate environment, both for daily household use and to sell for profit. Despite positive attitudes towards tree planting [18,19] and awareness of the negative consequences of a lack of social support for deforestation—making the intention to cut down forest trees generally low—extreme poverty and a lack of alternative income opportunities [20] continue to fuel deforestation.

Fourth, energy. The extraction of resources from forests is the main source of many essential products for the rural poor, most notably fuelwood. In fact, "over 90% of the energy demands of the

country for domestic and industrial use are met from wood energy” [7] (p. 2). Trade in firewood and charcoal is the primary source of income for many rural poor and the only form of cooking fuel for 99% of the population [21].

Other extractive industries supported by forest resources also include poles and timber for home construction and hand tools, as well as non-timber forest products such as thatch, mushrooms, caterpillars, bushmeat, beeswax, medicinal plants, and materials for handicrafts [13,16]. Malawi also has a large pool (in terms of both diversity and quantity) of indigenous fruit tree resources [22–24]. These forest food “resources are an insurance against hunger and malnutrition. They provide much needed dietary diversity which avails both macro and micro nutrients necessary for good health” [13] (p. 30).

Although these goods are “free” to Malawians with access to forests, monetary value can be assigned to these products based on what a person without access will pay for it. Using this method, it was estimated that an annual supply of firewood equated to almost half a year’s supply of maize (or 416 kg using 1996 prices) for a household, and an annual supply of poles equated to 120 days’ supply of maize [25] (as cited in [13]). Using data from the National Statistical Office of Malawi, the Forestry Research Institute reports that “studies on micro-enterprises in Malawi have shown that most people who sell forest produce do so as individuals or as small family operations, start off with little, if any, capital outlay, produce small quantities of mainly unprocessed or crudely processed goods and make little profit” [13] (p. 33). As a result, little to no profit or savings are generated, as monies earned are used to meet immediate domestic needs rather than used for savings and/or investments.

On a national level, forests account for 12% of Malawi’s natural capital [26]. A highly conservative underestimate is that Malawi’s forests contribute 6.2% of GDP [27]. Another more comprehensive evaluation reveals that forests contribute 8% of GDP with a substantial total economic value and enormous economic contribution to livelihoods [26]. These underestimates do not take into account many environmental protection, goods, and ecosystem services provided by forests. Taking a small subset of the services provided by soil, forests, fisheries, and wildlife into account, it has been estimated that Malawi’s GDP would be higher by 5.3% per year (2007 prices) were it not for unsustainable use of these resources. The discounted cost of damage over a 10-year period equated to 21.4% (in 2010) of GDP [28]. Over half (11%) of this 21.4% value was attributed to forests with only wood products, flood prevention, and air pollution services taken into account. The unsustainable use of forest resources and loss of economic value is negatively impacting Malawi’s growth, where resources are limited and even small gains in natural and economic resources could have significant impacts on people’s ability to meet basic needs.

1.3. Response to Deforestation

The national government recognizes the crucial regulating services (e.g., climate regulation, moderation of extreme weather, soil erosion, and pollination), habitat/supporting services (e.g., biodiversity), and cultural services (e.g., tourism) of forests [29]. Citizens are more aware of the provisioning services such as food, raw materials, and medicine that are acutely tied to their daily lives, but there is increasing awareness of the regulating services forests provide to maintain supplies of fresh water, prevent flooding, protect crops from wind damage, stabilize soil, and avoid excessive siltation of riverbeds downstream.

The largest threat to these services is occurring on customary lands, where ownership or usufruct rights (rights held by a member of the land-holding community in customary freehold [9]) “rest with individual villagers or group of individuals who the customary authority have appointed or delegated temporary ownership to, otherwise all authority rests with the customary leaders” [13] (p. 25). These lands are controlled by people residing in villages and the Traditional Authorities who oversee land tenure and land disputes on customary lands. Little research has been conducted at the local level on forests located on customary land [30]. In line with Malawi’s move towards decentralization and community-based forestry, local level interventions are key to understanding country-level trends and policies that address deforestation [31].

1.4. The Misuku Hills Study

The Misuku Hills of Malawi have been recognized as one of the world's Key Biodiversity Areas [32]. There are three small forest reserves in the Misuku Hills, but it is the largest contiguous area of remaining forest in Malawi on customary land outside of public parks and forest reserves. This is most notably due to its comparatively low population. To maintain the integrity of this slowly dwindling forest, the policies that govern forest conservation must be understood for their applicability in this region and their pertinence to local control of forest resources and management of ecosystem services. There is a great need for local ecosystem service assessments in Africa that capture local resources and needs [33].

There is a long history of forestry conservation in Malawi, and the most recent forestry policies recognize deforestation as a cross-cutting issue with various drivers and impacts on a myriad of development goals. In line with the purpose of this special issue of *Forests*, we explore the policies aimed at forest protection in Malawi and discuss the challenges and opportunities faced in their implementation nationally and locally in the Misuku Hills bioregion. The research activities of this inter-disciplinary study are therefore threefold. First, an assessment of national forestry policies was conducted to determine how Malawi's forestry policies have evolved and how current policies aim to guide forestry conservation activities. Second, an inventory of the forestry conservation activities in the Misuku Hills region was conducted to determine how these policies are being applied to protect one of Malawi's last remaining indigenous forests on customary land. Third, an ecosystem services assessment was conducted using a Photovoice methodology in a remote village on customary land in the Misuku Hills.

The results reveal that Malawi has enacted a plethora of forestry policies that have been developed to meet international standards. While these policies should be lauded, the case of the Misuku Hills reveals that the full potential of these policies is underwhelming due to weak implementation and shortcomings in empowering communities to practice local control. The ecosystem services inventory conducted in Chikutu village reveals that community members have extensive knowledge of forest resources, and these resources are still readily available to the indigenous communities. These findings underscore the important role that community-based and indigenous land tenure regimes play in advancing national forest policies. The paper begins with a description of the materials and methods of analysis, followed by the results on national and local forest conservation policies and practices. The paper concludes with an examination of implications for forest management in the Misuku Hills forested region and proposals for future research.

2. Materials and Methods

2.1. Malawi Forestry Policy Evolution and Analysis

The search and retrieval of Malawi government forestry policy and guideline documents was conducted online and through personal communications with government officials, representatives of non-governmental organizations (NGO), and faculty at Mzuzu University. Policy document retrieval was further guided by a previous outline of forestry policies and by contemporary policies and guidelines that referenced previous policies. The search was focused on policies and guidelines directly related to forestry, although policies that included forestry conservation (e.g., environmental policy) were also reviewed. When the search for documents began to reveal no new information, and the body of policies could be considered comprehensive and complete, the policies were then reviewed for changes that have occurred over time. Some of the changes to previous policies were noted in the subsequent policies themselves. The evaluation of policy changes took into account changes in the form of government in Malawi and advancements and best practices in international forestry policies.

2.2. Conservation Activity Inventory in the Misuku Hills Forested Region

2.2.1. The Misuku Hills Forested Region Study Area

The Misuku Hills are part of the southern end and western branch of the East African Rift System within the Southern Rift Montane bioregion [34] and the Miombo woodlands ecoregion. The Misuku Hills forest, like other remaining forests in Malawi, is in upland and hilly areas and along the rift valley scarps [7].

The Miombo woodlands of the Misuku Hills are the most floristically diverse in the country [35], encompassing the vegetative/biotic communities of open canopy woodland of hills and scarps (*Brachystegia* spp.), open canopy woodland of plateau (*Brachystegia/fulbernardia/Isobertia*), closed canopy woodland of wetter uplands (tall *Brachystegia* spp.), and montane evergreen forest [36]. Within the Misuku Hills, there are three public forest reserves (FR): Matipa FR (1055 ha), Mughese FR (771 ha), and Wilindi FR (937 ha), all established in 1948 [6]. These forest reserves are largely composed of montane evergreen forest. The reserve land area comprises only a small fraction of the larger contiguous forest referred to in this study as the Misuku Hills forested region (MHFR). The MHFR spans a number of political and administrative boundaries, and data from these administrative units are presented below to provide context to the MHFR study area (Figure 2).

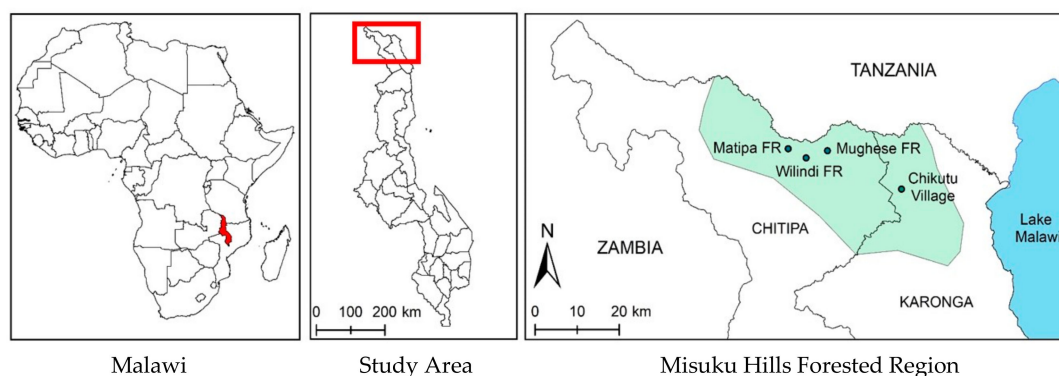


Figure 2. Location of the Misuku Hills forested region (MHFR) study area.

The area commonly identified as the Misuku Hills is within the administrative territory of Traditional Authority (TA) Mwenemisuku, but, from a biotic perspective, the contiguous forest of the MHFR spans two TAs and the country borders of Malawi and Tanzania (where they are referred to as the Umalila mountains). The focus of this study is confined to MHFR in Malawi.

Malawi is divided into three administrative regions (north, central, south), and the MHFR is one the most remote areas in the northern region of Malawi, where the most dramatic and highest concentration of hills and scarps are found. Since the country's independence in 1964, there has been a gradual migration of people to the northern region [37], but the effects of this migration on development in the region have been minimal. Only 13% (2,286,960) of the total population of Malawi lives in the northern region [12]. Not surprisingly, the northern region remains by far the most forested, with 48.7% tree cover as compared to the central (26.3%) and south (27.3%) regions [5]. Compared to Malawi's two other regions, the northern region has over double the rate of those reporting use of forest resources from their own land (9.9%), the highest proportion of forest resources use from communal land (18.2%), and the lowest proportion of those buying forest products from someone else (44.7%) [38]. Table 1 depicts the proportion of use and source of forest products in these two districts [38].

Table 1. Proportion and source of forest resources in study area districts.

District	Proportion of Enterprises Selling Forest Products	Own Land	Forest/Wild Park Reserve	Communal Land	Purchased from Someone
Chitipa	11.5	12.2	37.8	8.9	41.2
Karonga	12.3	15.0	27.7	41.6	15.7

Malawi's three regions are divided into a number of districts. The MHFR spans the borders of two of the seven districts within the northern region, Chitipa and Karonga. The population density of Chitipa (54/km²) and Karonga (107/km²) are both well below the country average of 186/km² [12]. This population density estimate for Karonga exaggerates the population density in its forested areas. Karonga is topographically unique, as it is split north to south between coastal lake plains to the east and hills and scarps to the west. The overwhelming majority of the population resides in the lake plains. The population density in the hills and scarps of Karonga is similar to that of Chitipa district.

It is difficult to accurately estimate the population of the MHFR study area, as it overlaps census units, but most of the MHFR is within the administrative unit of Traditional Authority (TA) Mwenemisuku. Field observations in the area of the MHFR outside TA Mwenemisuku confirm that it is very lightly inhabited. In 2018, the population of TA Mwenemisuku was estimated at 25,816 [12]. Strangely, this is approximately 2000 fewer people than the 2008 census estimate. The land area of TAs was not available, but TA Mwenemisuku is similar in size to other TAs in Chitipa. Since its population is about average for TAs in the district, its population density is likely very close to the very low population density for the district (54/km²). A hot spot of change analysis reveals that while some districts in the northern region experienced significant forest and natural vegetation loss from 1990–2010, Chitipa and Karonga experienced no dramatic change [5].

Mapping these proportions allows us to view the MHFR as not conforming to administrative boundaries, and reveals that it has the largest contiguous area of community forest and woodlot opportunities in the country, high forest management of natural forest opportunities, and high priority for food security and biodiversity intervention [39]. This leads us to examine the interventions that have been conducted in the MHFR to pursue these opportunities and protect its forests.

2.2.2. Conservation Activities Inventory

The conservation activities inventory aims to remedy the lack of accurate accounting of the past and current conservation activities in the MHFR. The search for forestry conservation activities in support of forestry policies was conducted through an online search and through personal communications with government officials, representatives of various conservation-oriented NGOs, and faculty at academic institutions in Malawi and the United States (US). The inventory of conservation activities in the Misuku Hills was further guided by a historical summary of community-based forest management activities nationwide [40]. The most insightful sources of information came from NGO project reports and personal communications with representatives of NGOs and sponsoring agencies who have operated in the Misuku Hills, as well as a current US Peace Corps Volunteer who lives and works in the Misuku Hills performing environmental conservation activities.

Since the vast majority of the land area of MHFR is on customary land and not in the montane evergreen public forest reserves, an ecosystem services assessment was conducted in the representative village on customary land to determine the extent and variety of services reaped by residents in these typically overlooked areas within the MHFR.

2.3. Chikutu Village Ecosystem Services Inventory

Chikutu village is located in the MHFR to the east of public forest reserves and just outside the eastern boundary of TA Mwenemisuku in TA Kilupula in Karonga district. TA Kilupula, like the aforementioned Karonga district in general, is split north to south between coastal lake plains and hills

and scarps. Chikutu is located deep in the lightly populated hills and scarps to the west of the lake plains. It is accessible by an unimproved, and at times impassible, dirt road. In ideal conditions it takes a 4 × 4 capable vehicle or motorbike approximately two hours to scale the hills to reach Chikutu from the main M1 highway paralleling the lake shore to the east.

This area around Chikutu is less populated than the area around the forest reserves to the west and represents one of the last hideouts in Malawi, where residents could directly reap ecosystem services from largely intact natural forests. If there is anywhere in Malawi where Malawians can still reap an array of benefits from a relatively intact natural forest on customary land, this is the place. It provides a lesson for the larger MHFR, the vast majority of which is on customary land.

The unique topographical and population dichotomy of northern Karonga makes Chikutu an interesting case. Chikutu, and other villages in the area, could be facing pressure to deliver forest goods to the much more highly populated areas in the coastal plains that are almost exclusively agricultural lands with greatly diminished forest resources.

Google Maps® designates this area as the Matipa Complex Forest. It is not clear how this designation was made, as there is no discernable local knowledge of this designation or reference to it in any forestry policy or conservation plans.

2.3.1. Ecosystem Services Assessment Photovoice Exercise

Photovoice is a praxis-based qualitative tool that enables participants to record, reflect, and produce knowledge on their community needs, experiences, strengths, and concerns through specified photographic techniques [41–43]. Participants use photography to represent their perspectives and lived experiences on a given topic and collectively discuss and analyze photos to inform community projects and advocate for their interests. Regarded as a tool to give agency to disempowered and marginalized groups in transforming their realities, Photovoice has been used in several disciplines, such as urban planning, education, public health, and sociology [44–49]. Because of the wide appeal of participatory photographic methods, it has been used with children, youth, and adults in various settings, ranging from youth programs, women's groups and organizations, to public health organizations [50–53].

In the context of this research project, Photovoice was used to provide deeper insight into the context of rural resource dependent communities and the ways in which groups derive value from their relationships with forest ecosystems. Few studies on ecosystem services assessments have utilized Photovoice as a research method [54,55], which makes this work unique and fills a significant gap in the literature.

Prior to conducting the Photovoice ecosystem services assessment, a number of necessary permissions were obtained. The Principal Investigator (PI) applied for and was granted the necessary permission to conduct research in Malawi from the National Committee on Research in the Social Sciences and Humanities under the Malawi National Commission for Science and Technology (Ref No: NCST/RTT/2/6). Once on site, the PI and co-PI met with TA Kilupula to inform him of our activities and seek his permission, which was granted. TA Kilupula oversees 16 Group Village Headmen (GVH), and hundreds of Village Headmen/women in northern Karonga, including the GVH in Chikutu. The PI and co-PI also informed the GVH in Chikutu of our arrival date and research prior to the data collection visit.

The co-PI is a Malawian who has lived in northern Karonga his entire life. He is an extremely well-respected member of the community, is fluent in the handful of languages spoken in the region, and is an employee of the Ministry of Health of Malawi. The PI has known the co-PI for nearly 20 years, two of which (1998–2000) were spent working together at a rural hospital in northern Karonga. Prior to fieldwork, the PI and co-PI met many times in Malawi to discuss the purpose of the study and to refine the Photovoice methods and procedures.

Photovoice involved community members photographing the lands and natural elements around their villages that they perceived as essential to their health and livelihood. The exercise replicated the Misuku Hills biodiversity and livelihood transect walk conducted in 2015 with Village Natural Resource Management Committee (VNRMC) members in the area around the forest reserves [56],

but added photographs of ecosystem services identified by residents. The assessment was conducted throughout the mid–late summer months when many resources are in season and available, but data on resources not available during these months were also collected.

The Photovoice methodology was applied to the ecosystem services assessment to overcome the limitations in articulation with text-based research and the asymmetrical power balance inherent in other research techniques. While allowing research participants to drive the process might frustrate the answering of a narrow set of questions and evidence is often not generalizable, it is abundantly useful for “building participant-driven practical theory about how environments impact everyday people” [49] (p. 400). The Photovoice variation used in this study combining a walking tour with picture taking replicates the method used in an informal settlement in Lusaka, Zambia [49]. This method gives a significant level of control over to participants and roots the data in lived experiences.

Upon arriving in Chikutu, we began by meeting with the Village Headman and the study participants to explain the purpose of the visit and to receive informed consent. The Photovoice participants included four men and three women of ages ranging from adolescent to adult. The field research in Chikutu proved to be an opportunity to educate residents on informed consent standards and procedures. Before the Photovoice exercise, the participants, PI, and co-PI reviewed the informed consent form that had been translated into the local language (Chitumbuka). One representative from the participants read aloud each section to ensure that any illiterate participants understood what was being consented to, and, following each section being read aloud, the co-PI reiterated the information and asked if any participants had questions. Although Chikutu is very remote, residents have had occasional contact with government officials collecting data, but none of the residents had ever completed an informed consent. After the form was signed, the PI and co-PI encouraged residents to demand informed consent from future researchers so that they would be fully aware of the risks and benefits of participating in research.

Once the Photovoice ecosystem services inventory walk commenced, the participants pointed out a resource, a photograph was taken of the resource, and its local name and common uses were recorded. The participants were given slight prompts to provide a little more explanation when necessary, but at no point did the researchers independently point out a potential resource and ask “what is this?” The participants were given full control to point out the resources that were important to them for their health and livelihood and to end the exercise when they felt a full accounting had been collected.

3. Results

3.1. Malawi Forestry Policy

The data from this section are aimed at addressing the first of the three research questions: What are the forestry policy challenges and opportunities for forest conservation in Malawi?

Timeline of Malawi forestry policies and guidelines and selected other policies directly affecting forestry policies:

- 1942 *Forest Act*: Pre-independence command and control forest management
- 1994 *National Environmental Action Plan*
- 1996 *National Forest Policy*: First post-independence forest policy aimed at supporting the 1996 National Environmental Policy and the Environment Management Act
- 1997 *Forestry Act*: Enabling and enforcement legislation to support 1996 forest policy
- 2001 *National Forestry Program*: Strategic framework for linking policy and practice or to translate good intentions into real results
- 2001 *Forestry Rules*
- 2001 *Forestry (Community Participation) Rules*
- 2003 *National Forest Policy*
- 2003 *Forestry Amendment Rules*

- 2003 *Community Based Forest Management*: Supplement to the 2003 National Forestry Policy expanding on “aspects related to community based forest management, including access to resources, benefit sharing, the role of traditional leaders, and decentralization” [57] (p. 10)
- 2004 *National Environmental Policy*: Includes principles and strategies for sustainably managing forests
- 2013 *Standards & Guidelines for Participatory Forestry in Malawi*: Developed to guide the practice of participatory forestry management and establish standards for forestry extension service delivery and improved forest management
- 2016 *National Forest Policy*: Coordinates all natural resource management, including forest resources and environmental policy instruments in Malawi
- 2017 *National Forest Landscape Restoration Strategy*
- 2017 *Environment Management Act*
- 2018 *A Framework for Monitoring Progress on Malawi’s National Forest Landscape Restoration*

There has been a clear evolution in forest policies under Malawi’s three distinct forms of government that span its colonial demarcation as a country to its current multi-party democracy system. During the colonial era’s command and control system of management (1890s to 1964), “forest guards were posted in every Traditional Authority ... to police forestry use and collect revenue for government from forestry products” [7] (p. 2). With independence from colonial rule in 1964, and under a new authoritarian one-party state, the focus turned to plantation timber production for local and international trade. Concurrently, forested land under the control of traditional leaders experienced accelerated deforestation and degradation as communities pursued extractive practices as a demonstration of political independence from a colonial system of forest management [7].

During Malawi’s transition to a multi-party democracy in 1994, demand for forest goods and services far exceeded supply, putting further pressure on forest systems [58]. To address recognized environmental and forest issues in Malawi, the Forestry Policy was revised in 1996. The 1996 National Forest Policy was a departure from the traditional forest management approach, most notably with its marked move towards devolution of centralized powers to promote participatory management [57,59,60]. This new strategy emphasized “multi-stakeholder participation including local communities” [7] (p. 2). Unfortunately, democracy was also equated with deregulation and the deforestation of forest reserves for agriculture and fuelwood [61].

Many of the devolution objectives acknowledged forestry financing and enforcement challenges. To remedy these challenges, a market approach was adopted to provide economic incentives that promoted the sustainable utilization of forest resources by emphasizing local ownership and management of forests and small- and medium-scale forest-based industries. Local management of forest resources was designed to be achieved through community-based forest management practices embedded in traditional institutions and giving communities shared or exclusive decision-making rights [7]. Another notable change in the 1996 policy was the explicit recognition that forest conservation policy objectives were supporting quality of life measures for rural populations recognized as the most disadvantaged group in Malawian society [58]. The 1996 forest policy was also used to support the larger framework of the 2004 National Environmental Policy, which itself is aligned with Section 13(d) of the 1995 Constitution of Malawi outlining many environmental goals.

Subsequent enabling legislation, forestry policy updates, and participatory management guidelines all support the current 2016 National Forest Policy goal to provide “guidance to the management of forests, offer an enabling framework for all stakeholders to participate in the management of forests, and sustain the contribution of the national forest resources for the upliftment of the quality of life” [27] (Foreword). Although the recognized role of forests in supporting quality of life is still an objective of the 2016 National Forest Policy, its focus on the rural disadvantaged is no longer explicit. While the 1996 policy was emblematic of a new democracy facing a recognized threat, the 2016 policy is more outward looking and reflective of a young participatory democracy on a world stage. This is evident in its stated alignment with international agreements and conventions such as the

Rio Declaration, United Nations Framework Convention on Climate Change, the Montreal Protocol, United Nations Convention to Combat Desertification, United Nations Convention on Biological Diversity, United Nations Convention on International Trade in Endangered Species of wild fauna and flora, and the claim that the review of the policy was conducted by a wide range of stakeholders, including traditional authorities, district councils, the civil society, the private sector, statutory bodies, government departments, academia, and the general public [27].

The 2016 policy recognizes that forestry conservation is a cross-cutting issue which requires collaboration and broad participation to meet the goals of other focused policies, such as those addressing land, biodiversity, wildlife, water, energy, and population, but also the more comprehensive Malawi Growth and Development Strategy now in its third iteration. Among the policy outcomes aimed at protecting forests are financial benefits and other livelihood outcomes (e.g., food, biomass, shelter, health). Financial incentives to protect forests include eco-tourism and recreation, and also still include forest-based enterprises. The livelihood outcomes are realized in the goods residents reap on a daily basis and profit from to support their health and well-being.

The implementation and enforcement of these policies remains a significant challenge, but the Environment Management Act of 2017 aims to address these challenges. This act created an Environmental Protection Agency “with broad and substantial powers to strengthen environmental planning and risk management at national and decentralized levels” [62] (p. 2). If the same implementation challenges that have thwarted previous legislation can be overcome, this act “will be one of the most powerful legal instruments for environmental management introduced so far in Africa” [62] (p. 2). This act, like others, focuses heavily on local control of environmental resources.

3.1.1. Village Natural Resource Management Committees and Village Forest Areas

Locally developed and enforced customary laws have shown to have a greater impact on the protection of natural resources as compared to federally developed and enforced laws [63]. This is partially due to human and institutional resource constraints that continue to make government sponsored patrolling, enforcement, and prosecution a challenge. Customary control alleviates these resource constraints and aligns with the customs and rules that govern everyday life and natural resource management and sanctions in Malawi. “Locally developed and enforced resource-use rules which relate directly to the resource in question”, are more easily monitored by other community members, and acknowledge a culture where subjective norms are well known within communities, weigh heavily on decision making, and traditional penalties are generally accepted [63] (p. 93).

Recognizing the necessity of local control and influence of customary law, key among the strategies to achieve the objectives of national forest policies is the establishment and support of Village Natural Resources Management Committees (VNRMC). These nationally registered committees receive technical advice from the Forestry Department officers on how to protect, control, and manage their forest resources [13]. Under Forest Rules 2001, the VNRMC has the authority to prohibit residing in protected areas, altering for agriculture, or damaging trees for any purpose (along with selected other powers). The local Forest Management Agreement created by VNRMC in consultation with Forestry Department officers governs the activities of demarcated Village Forest Areas [63].

Village Forest Areas (VFA) are areas on customary land that are actively managed by the VNRMC for forest resources or forest re-establishment. As with all customary land, and following customary law, the responsibility for allocating and overseeing the VFA lies with the traditional leadership of the Village Head, Group Village Head, or ultimately, the Traditional Authority.

During the colonial era, every village was required by law to have a VFA to oversee the conservation of wood products, water, biodiversity, and recreational facilities. “A total of 69,000 hectares of VFAs were set aside by 1940, under the control of local headmen and for the purpose of local use” [6] (p. 1). VFAs are no longer required by law, but with devolution to local level control, these VFAs remain critical to forest conservation and are often the only body overseeing forest conservation.

There were over 2000 “active” and another 1000 “trained” VNRMCS in Malawi in 2002 [6], and the scope of their activities have expanded in line with heightened knowledge of the critical role of forests in local and global ecosystems. Many VNRMCS are now tasked with reforestation, and tree planting activities often receive wide media coverage. Their influence has waxed and waned since the colonial era establishment of VFAs, but the move towards decentralization since 2008 provides guarded hope that their influence will return. Granted, it will likely take time to overcome decades of centralized control and the re-adoption of local responsibility. It is a promising sign that the large youth populations in Malawi are taking center stage as stakeholders in VFAs [64], although the national youth tree planting program has also experienced shortcomings in government administration [65].

3.2. Conservation Activity Inventory in the Misuku Hills Region

The data from this section are aimed at addressing the second of the three research questions: What conservation activities are taking place in the Misuku Hills in support of these policies?

It has been documented that forest management activities in Malawi often involve three parties: “a facilitator who catalyses the process (often coming from outside the community), the implementing agency (a local group or committee spearheading the change process) and the benefiting community” [7] (p. 6), and this holds true for the activities that have taken place in the Misuku Hills since 1999. The facilitators have often been Malawian NGOs backed by international aid organizations (Table 2). It is apparent in Table 2 that NGOs, and not government, have been the catalyst of forest conservation activities, with government officials acting in an advisory capacity. NGOs that operate in Malawi must be registered with the Registrar General in the Department of Justice and the NGO Board of Malawi. They may also voluntarily become a member of the Council of Non-Governmental Organizations in Malawi (CONGOMA).

Table 2. Inventory of sponsored forestry conservation activities in the Misuku Hills.

Date	Project	Implementing Organizations	Funders
1999–2004	COMPASS I	Development Alternatives Inc.	USAID ¹
2006–2009	COMPASS II	Development Alternatives Inc.	USAID ¹
2006–2010	IFMSLP I	LTS ²	European Commission
	IFMSLP II	GOPA ³	
2011–2014	Improved Livelihood and Biodiversity Conservation Project	Subcontract to CEPF ⁴ , AfES ⁵	European Commission
2013	Misuku Hills Indigenous Forest Project	Subcontract to CEPF ⁴ , MBA ⁶ , SDI ⁷	British High Commission
	Misuku Beekeeping Value Addition Project	MBA ⁶ , SDI ⁷	
2013–2015	Promotion of Indigenous Forests in the Misuku Hills Area	MBA ⁶	UNDP GEF ⁸
2017	Misuku Hills Art Challenge	AfES ⁵ , MBA ⁶ , SDI ⁷	CEPF ⁴
2018	Small Producers Development Project	MBA ⁶ , SDI ⁷	IM-Swedish Development Partners

¹ United States Agency for International Development; ² LTS historically stood for Land and Timber Services, but it is now just LTS as a stand-alone title; ³ Gesellschaft für Organisation, Planung und Ausbildung; ⁴ Critical Ecosystem Partnership Fund; ⁵ Action for Environmental Sustainability; ⁶ Misuku Hills Beekeepers Association; ⁷ During the time of the project, the organization was called Sustainable Rural Growth and Development Initiative (SRGDI), but the organization is now called Sustainable Development Initiative (SDI); ⁸ United Nations Development Program Global Environment Facility. COMPASS, Community Partnerships for Sustainable Resources Management; IFMSLP, Improved Forestry Management for Sustainable Livelihoods Program.

The remoteness of the Misuku Hills contributes to it being one of the last contiguously forested regions of Malawi not in a national park, but this feature has also caused it to be overlooked by conservation organizations and funding agencies operating in other regions of Malawi. Despite this, there have been a handful of forest conservation activities that have engaged the VNRMCS in the Misuku Hills charged with managing both VFAs and the three public forest reserves.

The two phases of the Community Partnerships for Sustainable Resources Management (COMPASS) project were national in scope with Misuku Hills as one among many intervention sites. The very limited documentation available on the activities and results of COMPASS I reveal that it was meant to improve natural resource management by emphasizing income generation, which is

consistent with and supporting USAID/Malawi's Strategic Objective framework of sustainable increases in rural incomes [40]. Unlike COMPASS I, there is abundant documentation of COMPASS II [66]. COMPASS II "supported decentralized environmental management and capacity building in enterprise development in order to mainstream CBNRM [community based natural resource management] as a viable rural development strategy (COMPASS II Project, 2007)" [40] (p. 24). COMPASS activities in the Misuku Hills included the support of the Mzuzu Coffee Planters Cooperative Union (MCPCU) to engage in honey production. Honey production was promoted not only for the sale of honey and beeswax products, but also for pollination of coffee crops. The accomplishment of COMPASS targets were initially monitored across 15 districts in Malawi, including Chitipa, but then reduced funding in 2007 led to only seven districts being monitored, excluding Chitipa [67]. Therefore, the effectiveness of these programs cannot be evaluated, and this lack of evaluation proves to be a theme throughout subsequent forest conservation activities.

The Improved Forestry Management for Sustainable Livelihoods Program (IFMSLP) was a Government of Malawi, two-phase, national capacity-building exercise aimed at improving "the livelihoods of forest dependent communities through improved sustainable collaborative management of forests both in forest reserves and customary land" [68] (LTS webpage). IFMSLP I and II were aimed at the implementation of the National Forestry Policy and Program through community mobilization, institution building, and local forest management planning [69,70]. One of the IFMSLP intervention sites included the area within and around the three public forest reserves in the Misuku Hills [6]. IFMSLP II faced funding and implementation delays, but it was eventually pushed forward with a reduced set of strategies [70]. It was discovered through personal communications that the delays were due to suspected government corruption which caused the funding agency to halt the project, but it did eventually resume with "competitive grants for non-state actors to enhance their role in, and to accelerate, project implementation" [70] (p. 1924).

There is a conspicuous dearth of documentation available on the activities and outcomes of the two phases of the IFMSLP, but one available document was an evaluation of IFMSLP I completed in 2011 [71]. The evaluation was critical of the lack of monitoring and evaluation, which may help explain the lack of available documentation. Despite the program setbacks and the lack of data on program activities and outcomes, there were still some identifiable results.

On a national level, the IFMSLP led to the development of the national 2013 Standards and Guidelines for Participatory Forestry in Malawi [70], as referenced in Section 3.1.1. The IFMSLP activities and outcomes specific to the Misuku Hills intervention site were uncovered through communications with NGOs who received the "competitive grants for non-state actors" to pick up the pieces from the mixed successes of IFMSLP I and a halted IFMSLP II. One tangible outcome was the creation of the Matipa Forest Management Plan (in draft form and still under review by the Forestry Department) created under the Improved Livelihood and Biodiversity Conservation Project. This plan was designed to govern the activities of the VNRMCS in this area and create a greater sense of ownership by the surrounding communities to relieve unsanctioned pressures on the forest reserve resources. It was based on and serves the larger Strategic Forest Area Plan (SFAP) for the Matipa, Mughese, and Wilindi forest reserves, with a focus on three of the five priority objectives in the SFAP. These are to (1) increase in tree planting and natural regeneration, (2) conserve the forest for water catchment protection, unique biodiversity, and cultural heritage, and (3) regularize extraction of forest resource and products from forest reserves to uplift communities' livelihoods. The creation of forest management plans for all three forest reserves was originally the responsibility of the Department of Forestry in IFMSLP I, but only one of these plans has been prepared. The Matipa Forest Management Plan includes estimates of the products and income that could be generated from the sustainable use of forest resources and a monitoring plan for patrols by local residents [72]. Responsibility for the creation of plans for the two remaining forest reserves (Mughese and Wilindi) remained with the Department of Forestry in IFMSLP II, but these plans have yet to be prepared.

The IFMSLP II also supported the creation of a number of forest management agreements and beekeeping activities under the Misuku Hills Indigenous Forest Project [73]. Seven VNRMCS composed of members from 71 villages now have co-management agreements and licenses to oversee the entire 2762 hectares of the three forest reserves in the Misuku Hills. These agreements include tree planting and regeneration on 485.92 ha in the forest reserves. These VNRMCS simultaneously manage VFAs on customary land, and there were seven VFAs established under the program (Alther, Chipala, Chiwi, Kapiyira, Lupalang'ombe, Mwenga, Nangalamu) with four of these VFAs (Alther, Chiwi, Mwenga, Nangalamu) currently with completed VFA management plans. Although there is no readily available national accounting of VFAs or their level of current activity, a forestry officer from Chitipa reported that there are 68 VFAs around the Misuku Hills, and 21 of these VFAs have management plans.

The Misuku Hills Indigenous Forest Project also included activities in and around forest reserves focused on beekeeping, candle making, and selling non-wood products. The Misuku Beekeepers Association (MBA) was the lead organization in this effort and has proven to be a prominent force for forest conservation in the Misuku Hills. MBA is a registered company comprised of more than 1500 beekeeper members with a 2:1 ratio of men to women [74]. MBA has actively contributed to the creation of forest plans, and their forest-based enterprises were further enhanced through this project. Support from this project led to MBA being chosen to represent Chitipa district at the National Agricultural Trade Fair, where they established business connections and received beekeeping product orders. These activities were estimated to have increased the income of 350 households in the area by 80%. MBA members also increased capacity in project management skills and conservation science by participating in two workshops in Mbeya, Tanzania and Nairobi, Kenya. Their participation at these workshops led the MBA being nominated by the Tropical Biology Association for a site visit and learning exchange with Save Tanzania Forests.

The Misuku Beekeeping Value Addition Project (MBVAP) and Promotion of Indigenous Forests in the Misuku Hills Area (PIFMH) project occurred simultaneously with the Indigenous Forest Project discussed above. The MBVAP was aimed at continuing to build capacity in the forest-based enterprise of beekeeping among the estimated 2500 beekeepers in the Misuku Hills who produce honey at a subsistence level. Honey was being sold unprocessed and uncertified in unreliable markets in their area, and the beeswax was just thrown away. The project supported the training of 250 members of 50 beekeeping clubs in beekeeping techniques and honey and beeswax candle making; the provision of equipment and materials; certification of honey and candles; and linking farmers to markets [74]. The reported results of the project were “overwhelming.” The 50 clubs that were trained were registered with MBA. MBA acquired certification from the Malawi Bureau of Standards and used the processing equipment to create professional and standardized packaging for their Misuku Hills Honey (Figure 3). The combination of professional packaging and certification was attributed with over an 80% increase in the value of their honey. MBA honey can now be found on grocery store shelves across the country, and it is being used as an ingredient in cough syrup by a pharmaceutical company. This has reportedly led to 300 households increasing their income by 50%. Although the wax processing and candle making plant was established and most of the clubs 50 clubs were trained, inadequate funding was given as a reason why the candle making venture has yet to be realized.

The PIFMH project also promoted beekeeping, but it was focused solely on the Mugheze forest reserve and included the promotion of nutritional and medicinal products and “reconnecting cultural values with existing nature” [75] (webpage). Although no evaluation report on outcomes of the PIFMH was available, its status is listed as “satisfactorily completed” [75].

The relationships built between stakeholders and organizations in all of these projects led to further collaboration in the Misuku Hills Art Challenge (Figure 4) aimed at raising “awareness of the beauty and ecological, cultural, aesthetical and economic value of Misuku Hills Forest Reserve both locally and internationally” [76] (webpage).

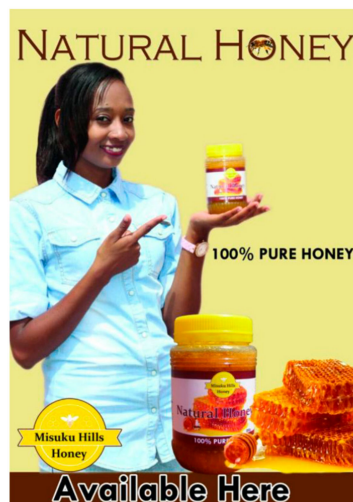


Figure 3. Misuku Hills Honey. Source: Sustainable Development Initiative.



Figure 4. Misuku Hills Art Challenge: (a) Beekeeping training; (b) painting submission; (c) prize winning sculpture. Source: Sustainable Development Initiative.

The Misuku Hills Art Challenge (MiHAC) was a national competition that brought together 12 Malawian artists, photographers, and film makers to showcase the remote and often overlooked Misuku Hills and bring greater national and international attention to this Key Biodiversity Area (KBA) threatened by logging, charcoal production, and agricultural expansion. A smaller art competition was also conducted for school children in 10 schools surrounding the Misuku Hills. MiHAC was widely advertised through the national media and on multiple social media platforms, and an exhibition of the 16 paintings, 3 sculptures, 68 photographs, 3 films, and 10 children's drawings was convened in the capital city of Lilongwe with cash prizes given to the top artists.

The impacts of the project not only raised awareness of the Misuku Hills among the public, but also engaged numerous government ministries to encourage the inclusion of the Misuku Hills into policies and plans as a KBA. The Misuku Hills is recognized internationally as a KBA [32], but it is not currently recognized by the Government of Malawi as such. Participation by the Environment Affairs Department (Biodiversity Focal Point) brought attention to the need to conduct a biodiversity assessment as the first step in it being recognized as a KBA in national policies and plans.

MiHAC also introduced tourism as a new approach to forest conservation in the Misuku Hills, and tourism brought in the Ministry of Tourism as a new player in addition to forestry. The only accounting of tourism in the area estimated that the Misuku Hills typically received three local and international tourists per month, but in the six-month period following MiHAC, this rose to eight tourists per month, nearly tripling the income of VNRMCS that charged small fees to tourists [77]. The MiHAC project also brought greater attention to the production of Misuku Hills Honey and Mzuzu Coffee as potential tourist attractions. In addition to the previously discussed success of marketing Misuku Hills honey, the Misuku Hills is also where 50% of the internationally-renowned Mzuzu Coffee is produced. A small number of tourists travel to the Misuku Hills to sample the coffee and learn about the community that grows the coffee.

A number of potential donor organizations were also invited to and attended MiHAC events, and the Small Producers Development Project resulted from the interactions with a donor. A pilot project was conducted to continue the work of supporting beekeepers with financing, certification, production, and marketing, but it was reported that the donor ultimately decided that the Misuku Hills were too remote to conduct monitoring and evaluation, so they ceased supporting beekeeping activities. Again, the double-edged sword of its remoteness being part of its attraction but also creating difficulties in accessibility.

Lastly, there appears to have been a small project funded by the Tilitonse Foundation aimed at strengthening VFA plans, but no documentation on this project was available.

Although not in direct administration of the conservation activities in the Misuku Hills listed above, the Wildlife and Environmental Society of Malawi deserves mention as a major player in conservation activities in the Misuku Hills and throughout Malawi. They were credited as a contributor to many of the activities and policies identified in this study.

3.3. Chikutu Village Ecosystem Services Inventory

The data from this section are aimed at addressing the final research question: What ecosystem services are residents using that are in need of protection?

The Photovoice ecosystem services inventory took approximately three hours to complete. The residents of Chikutu village identified 16 distinct forest products in the immediate vicinity around their village (Table 3). This included seven different types of fruits, roots used for medicine, fiber and timber used for construction, vegetation that prevented soil erosion, the soil itself, mushrooms, and grasses and leaves for domestic animal feed. Figure 5 displays selected photos of identified forest products.

A greater volume and variety of flora were identified in the Chikutu ecosystem service Photovoice exercise than were identified in a previous participatory assessment conducted as part of the Improved Livelihood and Biodiversity Conservation Project.

Forest fruits are an essential part of the diet for rural populations in Malawi as they are a source of critical dietary nutrients (vitamin A and C, calcium, fiber, minerals) and contribute to food security, especially as a supplement in times of famine. Mushrooms also provide nutritional benefits and are sometimes preserved for food security purposes [25]. Fruits and mushrooms can be sold to persons residing in surrounding areas where forests have been degraded and these resources are scarce [13].

Table 3. Inventory of forest products.

Local Name	Type of Forest Product	Local Uses	Notes
Ndilolo	Tree ¹	Food	Nut casing consumed and used for juice
Manga	Tree	Food	Mango fruit
Munyere	Shrub	Food	Wild avocado
Miyombo	Shrub	Construction	Stems used for rope
Mulungalunga	Tree	Medicine	Roots
Masuku	Herbaceous plant	Food	Fruit
Mushombe	Bamboo	Construction	
Mufiomi	Tree	Timber	Recognized for water conservation properties
Mwina	Tree	Timber	Noted as being very dense
Malina	Grass	Timber	Also animal feed
Dongo	Soil	Food	
Ntochi	Herbaceous plant	Food	Banana
Chighughu	Grass	Erosion control	Also animal feed
Popo	Tree	Food	Papaya
Chiwowa	Fungus	Food	Mushroom
Guaves	Tree	Food	Guava

¹ Almost all trees are also used for wood fuel.

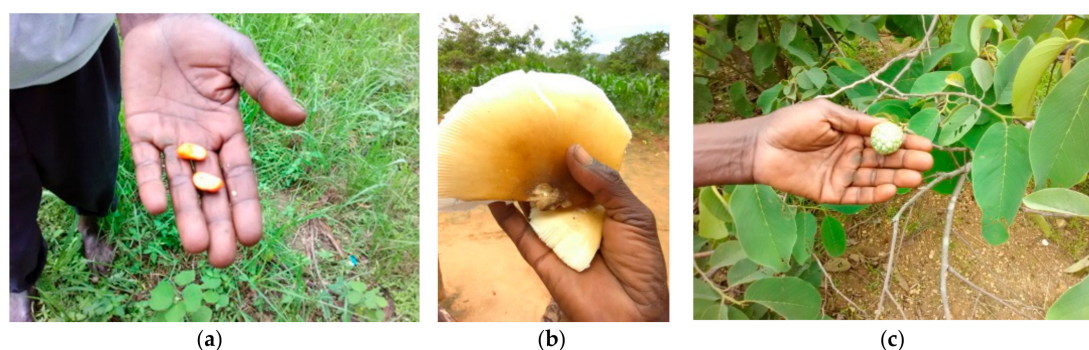


Figure 5. Selected forest goods in Chikutu: (a) Ndilolo (cashew-like nut); (b) Chiwowa (mushroom); (c) Munyere (wild avocado).

The remoteness and inaccessibility of Chikutu village has contributed to the abundance of these forest products, but lack of connectivity to other settlements also creates great difficulty in accessing markets. This lack of access to markets makes these goods essential as a food source and, at the same time, creates great difficulty in selling these products for profit. When asked directly about the sale of forest products, it was confirmed that they were only consumed locally. One notable absence in the identified forest products was the harvesting of wild animals and insects.

A number of ecosystem service assessments were also conducted in three villages in the lake plains area of Karonga with much higher population densities and diminished forests. While residents in these villages still appeared to be knowledgeable about forest product ecosystem services, these services were less abundant and diverse. Essentially, the less forested area had fewer identified ecosystem services.

4. Discussion

Malawi is faced with many challenges to forestry conservation and the subsequent sustainability of ecosystem services. However, as the results above revealed, Malawi has formulated—in collaboration with an array of international organizations—a number of policies and plans to meet these challenges. There have been attempts to implement these policies, but there are significant challenges to realizing their full vision and potential. The first challenge is a lack of current, reliable, and comparable data on forest cover and change, but efforts to remedy this are currently underway (Appendix A). Discussed below are a number of other challenges, as well as potential remedies discovered through this research: The challenge of good governance, the potential remedies of increased location control (e.g., Village Natural Resource Management Committees), and the promotion of forest-based enterprises. As the results of the policy inventory revealed, there is no shortage of actionable forest policies, but shortcomings in good governance has limited their implementation. The forest-based activities that have taken place in the Misuku Hills demonstrate the potential for local initiatives and control when centralized government fails. The inventory of ecosystem services revealed a previously unrecorded wealth of goods that could be sustainably marketed through forest-based enterprises. The discussion concludes with suggested directions for future research.

4.1. Good Governance

Weak institutions have been identified as one of the many factors threatening the Miombo forests of Africa [78,79]. The Democracy Index categorizes the relatively young multi-party democracy of Malawi as a *hybrid regime* [80]. The hybrid regime-type of government is characterized by a number of conditions that affect the implementation of forest policy, including serious weaknesses in political culture, functioning of government, and political participation; widespread corruption; weak civil society and rule of law; and a non-independent judiciary. Many of these threats to good governance were confirmed in a separate, albeit ideologically-driven, analysis of economic freedom [81]. Combined

with a lack of financial and human resources, these conditions certainly create challenges in the implementation and enforcement of forestry policy, and they are noted as a priority focus area in the most recent National Forestry Policy [27].

We see some of these challenges at the local level in the Misuku Hills. Among the reported lessons from one of the conservation projects in the Misuku Hills (intentionally not identified) was that corruption is a key challenge. It was reported, but not corroborated by the author, that government authorities accepted bribes to grant logging licenses to traders to cut down large trees in VNRMC co-managed forests without the consent of the VNRMC. These activities undercut the stewardship and disenfranchised the VNRMCs. Part of this can be explained by the lack of internalization of the co-management concept by government officials, despite the abundance of adopted national policies and guidelines promoting participatory forest management [82]. Throughout Malawi, residents and VNRMC members have demonstrated that they are willing to put in the effort, but they are bogged down by lack of support from the government officials with whom they co-manage forests. Even when drafts of local Forest Management Plans are created, there are significant delays in approving these plans, which demoralizes residents [82]. The Misuku Hills are a case in point. There has been a many years long delay by the Department of Forestry in approving the draft Matipa Forest Plan and finalizing the plans of the other two forest reserves, long after the local VNRMCs have done their part.

Despite these challenges, there are a great number of opportunities in good governance in Malawi. The national government has delivered on forestry policy, forest management acts and guidelines, and most recently a strategy for measuring progress on forest conservation. Furthermore, the total land area of public protected forests increased by 8% between 1998–2010 with more proposals for protected areas underway [29]. Malawi has also taken the bold step of temporarily deploying Malawi Defense Force soldiers to patrol the most threatened public forests [83]. Furthermore, it was reported that the National Tree Planting Season recently closed with 50 million trees planted on 25,000 hectares, just shy of the 60 million tree target [84].

Despite some negative and demoralizing interactions between VNRMCs and government officials, there have been positive interactions as well. The Misuku Beekeeping Value Addition Project reported “a lot of support” from the Ministry of Agriculture and Food Security, Community Development Officers, and Forestry Officers in the form of training and equipment and identifying markets [74]. The Forestry Department has served in advisory and administrative roles (see Indigenous Forest Project report), and their role will likely become more advisory with the continued movement towards central devolution to more local control.

4.2. Local Control

Malawi adopted a participatory forest management policy in 2001 (updated in 2003) and, as recently as 2013, adopted guidelines for participatory forest management to increase local control of forest conservation. There is ample guidance and authority for local control, but co-management challenges are still thwarted by a lack of policy implementation and capacity building at the local level [62,70]. This lack of implementation begins with government ministries and donors failing to fully engage and organize communities. Even in communities where VNRMCs have been organized, there have been many other challenges to their effectiveness in advancing local control. Two of these challenges are (1) a lack of empowerment to actively participate in decision-making and (2) a lack of downward accountability among leaders which has limited the devolution process [85].

Much of the community-based forestry management (CBFM) has been driven by donors, government, or NGOs and imposed on communities. While these activities may raise community awareness, they are not sustainable [70] and “undermine achievement of conservation and social goals” [86] (p. 687). They lack the community empowerment derived by involving community members in decision making and creating accountability mechanisms. COMPASS I and II are examples of imposed programs that do not properly empower communities or provide sufficient incentives for communities to continue the imposed project once the donors move on and funding ceases.

Empowerment in the decision-making process begins by understanding “the preexisting conditions and how communities understand and interpret the program” [87] (p. 338). One of these preexisting conditions includes the power relations in communities. In an evaluation of CBFM in southern Malawi, it was found that both the CNFM (community natural resource management) concept and implementation created new elites (forest committees) who largely operated as corrupt, unaccountable “village bureaucracies,” alienating communities from CNRM. Widespread forest degradation and institutional breakdown ensued. Community management became committee management, and part of the problem. Rare “success” was associated with idiosyncratic leadership qualities of village heads, suggesting need for enhancing roles and leadership skills of traditional leaders in balancing the exercise of power among CNRM stakeholders, and for broad-based community empowerment so that members can demand accountability from local leaders [86] (p. 687).

Both the CBFM committee and community members must understand that the CBFM committee is working for, and accountable to, the community.

Despite these challenges, there are a great number of opportunities for local control and the local protection of forests in Malawi. In fact, with a dearth of government resources to manage and monitor forests effectively, local control is currently Malawi’s only hope for forest conservation. It has been found that VFAs under participatory forest management (PFM) had higher tree species abundance and diversity than those without PFM [88]. This success was attributed to the regulation of access and the forest development work of communities who practice PFM in their designated VFAs.

As noted above, understanding the preexisting conditions is essential for the empowerment that would enhance local control. A fundamental preexisting condition that is ripe for success in its ability to engage communities and build understanding and trust is undertaking a participatory process in the inventory of local forest resources, such as the ecosystem services (ES) assessment conducted in this study in Chikutu. “Considerable indigenous knowledge and skills for managing forest goods and services are often available at village level” [16] (p. 6), and it is arguably remiss to protect forests without a locally-driven accounting of the resources that are available and in need of protection. These activities are in line with current policy. The Chikutu ES inventory supports the policy priority area five, strategy three of the National Forestry Policy noting indigenous knowledge acquisition and dissemination [27]. The Chikutu ES study found a number of services that were distinct from the more heavily studied area immediately surrounding the public forest reserves. It is only by engaging communities and respecting their knowledge to uncover these services that management priorities can be properly represented in local VFA plans.

4.3. Forest-Based Enterprises

Forest-Based Enterprises (FBEs)—interventions meant to empower communities to realize tangible benefits from forests—recognize that forest conservation and livelihood development are deeply intertwined [89,90]. FBEs tie people to local forests for their livelihoods, and this may be more realistic in the near-term as Malawi continues to defy the conventional development pathway and macro-level economic changes theorized as affecting forest conservation.

Usually, the transition from a low- to middle-income economy starts with an abundance of natural capital which is used to invest in infrastructure (produced capital) and education and health (human capital). At middle-income levels, produced capital roughly doubles its share and human capital grows rapidly to become the main asset. In Malawi, the opposite development occurred. Malawi is still highly dependent on its natural capital, which remained constant at 43% from 1995 to 2014, while human capital increased only slightly and produced capital shrank [62] (p. 5).

With human capital and produced capital near stagnation, Malawi has yet to follow the forest transition theory [91], which posits that economic development, industrialization, and urbanization causes an initial large decline in forest cover to fuel this development, followed by a slow increase in forest cover [92,93]. “In some places economic development has created enough non-farm jobs to pull farmers off of the land, thereby inducing the spontaneous regeneration of forests in old fields” [92]

(p. 23), but Malawi is still a largely agrarian-based economy, and FBEs may be asking people to be tied even more to the land instead of generating economic activity off of it, possibly perpetuating a “poverty trap” [92] when FBEs are not successful.

As Malawi continues to defy the conventional development pathway and the conditions necessary for a forest transition, FBEs may be a strategy only in areas where forests are still present. In the central and southern regions of Malawi, where the vast majority of the population lives, the near complete deforestation does not make FBEs a widespread solution to poverty alleviation and forest stewardship. The northern region (and the Misuku Hills, in particular), due to its lighter population and accompanying extant forest cover, is likely a better candidate for viable FBEs. Yet, FBEs may only be viable if the conditions that led to the deforestation of the central and southern regions are addressed; namely, a rapidly growing population of small landholders practicing largely subsistence agriculture on finite land. It is not until other developments that create technological separation, reduced population, urbanization, or all of these and other factors ensue before the people of the Misuku Hills can make FBEs more than a short-term solution. If larger external forces continue to diminish forests, there will be no resources remaining to sustain FBEs.

It is also critical to recognize that “households will not invest precious labour and time nurturing trees when there are more pressing needs for food security” [16] (p. 6). Sustainable agricultural practices must be implemented concurrently with the CBFM of “free” food stuffs from forests to ensure food security as a necessary precursor to the protection of forest resources.

There has been some successes of FBE in other regions of Malawi to protect the few remaining forests (e.g., Sustainable Management of Indigenous Forests program in Kam’wamba, Neno District in southern Malawi, 1996–2006 (see [7])), and also in the Misuku Hills with honey production, but the remote location of the Misuku Hills is a proverbial double-edged sword as it attributes to the quality of its forest but also creates challenges in transporting goods to markets and attracting all but the most adventurous tourists. One of the goals of the Misuku Hills Art Challenge was to raise awareness of the beauty and potential of this region for tourism. Even a slight increase in tourism to this area could have a dramatic effect on increasing recognition and spurring greater infrastructure development.

There has also been some success in the changing attitudes towards the protection of goods used to support FBEs. With awareness raised as to the importance of forest conservation to FBEs, there have been community protests and bad press when trees are harvested. For example, the District Forestry Officer overseeing the Misuku Hills had to address outrage at tree harvesting in the press, even when trees were being harvested sustainably on customary land and the trees in question were planted by inhabitants [94]. This culture of protection does have its limits. For example, although charcoal production is illegal and has been widely recognized as a major contributor to deforestation in Malawi, there are many instances of persons selling charcoal in plain view of those responsible for enforcing this infringement. This burgeoning culture of conservation may be driven by not only the potential losses of cash value, but also by the highly understudied non-cash value of forests.

Non-Cash Value

Zulu 2013 offers *reciprocal altruism* as a meta-theory [95,96] to understand the non-cash incentives for forest conservation in Malawi. This theory involves the “the trading of altruistic acts in which benefit is larger than cost so that over a period of time both enjoy a net gain” [70] (p. 361). Since there are many conditions that do not make FBEs viable in most places in Malawi, non-cash benefits may be more appropriate to remedy the “generally poor results” stemming from the “heavy dependence” on cash incentives in contemporary co-management projects [70].

In his critique of the national IFMSLP (see Table 2), but also applicable to the many programs carried out in the Misuku Hills, we tend to agree with Zulu that “a narrow emphasis on cash incentives as the motivation for ‘self-interested’ users to participate in co-management overlooks locally significant non-cash motivations, inflates local expectations beyond ability to deliver, and often creates perverse incentives that undermine socio-ecological goals” [70] (p. 1919). The promise of cash incentives in

FBEs have been found to produce “modest early gains in institutions and capacity building and forest condition, but low and generally disappointing cash benefits.” The disappointing results “burdened poor communities with conservation costs and created perverse incentives to overharvest, be dependent on the project/government, and to marginalize the local poor” [70] (p. 1919).

An additional assessment of CBFM in Malawi confirmed that many communities “also highly valued other non-cash based and environmental objectives and benefits, including the sustained access to firewood and NTFPs [non-timber forest products], social/religious services inside the forest, and continued water supply for consumption and irrigation” [82] (p. vii). Awareness of the non-cash value of forest ecosystem services appears to be high and might help explain a continued commitment to CBFM in forest reserves despite FBEs producing “disappointingly low financial benefits for poor communities burdened with conservation costs” [70] (p. 1936). In the ecosystem services assessment of Chikutu, no cash values were expressed, even when residents were explicitly asked about the potential to sell local forest products.

4.4. Future Research

This study is the first inventory and analysis of the policy potential, conservation activities, and ecosystem services in the Misuku Hills. This initial assessment aims to enable future studies to examine the impact of these policies and activities directed at protecting forests and the essential ecosystem services that forests provide to the indigenous populations in this region.

The primary suggestion on future research design is that the geographical scope of the Misuku Hills should be expanded to encompass the forested area on customary land. The larger Misuku Hills forested region on customary land has been completely ignored in research and largely ignored for inclusion in the conservation activities. Although a number of forest conservation studies were conducted in Malawi, very few have addressed the socio-ecological dynamics in remote areas such as the Misuku Hills, where forests are still abundant and small indigenous populations rely heavily on forest resources to meet daily needs.

Future research should also consider examining the dynamics between the Misuku Hills forested region and the highly populated area immediately to the east in northern Karonga. The lake plains to the east are almost completely deforested to support rice cultivation, but it is suspected that the communities in the lake plains rely heavily on the ecosystem services provided by the Misuku Hills. This dichotomy likely creates both opportunities and pressures on the Misuku Hills forested region that generate tensions that need further exploration.

Lastly, a recommendation regarding informed consent. As noted in Section 2.3.1. Ecosystem Services Assessment Photovoice Exercise, the residents of Chikutu were never previously exposed to the informed consent process. This study proved to be an opportunity to teach residents about their rights as subjects of human research and to demand informed consent from future researchers. Any future research should be prepared to confront a lack of awareness of informed consent protocols and empower residents through education about their rights.

5. Conclusions

Since independence, Malawi has enacted a plethora of forestry policies that have been developed to meet international standards, including policies that promote local control and community-based forest management. What appears to be lacking is the widespread implementation of these policies and the empowerment of communities to practice local control. Despite these challenges, the forest conservation activities in the Misuku Hills demonstrate the potential for rural communities to organize and assume stewardship of forests both on customary land and in public forest reserves. In fact, a focus on communities such as those in the Misuku Hills is necessary to protect the last remaining indigenous forests and the indigenous communities that depend on forests for their livelihood. The ecosystem services inventory conducted in Chikutu revealed that community members have extensive knowledge of forest resources, and these resources are still readily available in communities residing in Malawi’s remaining forests.

Malawi continues to be an anomaly on the macro-level economic development pathway. Its poor and rapidly growing population and widespread practice of subsistence agriculture will continue to place pressure on Malawi's forests. Until there is a change in these social forces, an increase in the diversity of livelihood opportunities off the land, and improvements in state institutional capacity, local control and stewardship will be necessary to conserve and regenerate the forests of Malawi.

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Appendix A

Forest Cover Data Discrepancies and Implications

There have been a number of noted discrepancies in estimates of Malawi's forest cover, rates of deforestation, and forest land tenure designations derived from outdated data sources [6,29]. The presentation of these discrepancies below is meant to instigate a critical evaluation of published forest cover estimates and to shed light on possible recent gains in forest cover (possibly due to enacted forest policies) and current efforts to remedy widely disparate forest cover estimates. It is certainly not meant to close the case on what led to these discrepancies, nor could it as much of the information on estimate sources and methodologies cannot be obtained.

Alarmist statements from as recent as 2019 that “over the last 40 years, more than half of Malawi's forests and woodlands have vanished” [62] (p. 1) are certainly dramatic, but they mask apparent recent gains. Admittedly, these gains are not easily discernable without a more deconstructed examination of trends in Malawi's forest loss over time that reveal a guarded optimism towards recent achievements in reforestation.

One cited estimate from 2016 is that Malawi is losing forest cover at a rate of 2.8% (250,000 ha) annually [27]. The 2.8% assessment appears to have been derived from a 1993 Biomass Assessment Report (assessment conducted in 1991), but this estimate masks significant changes over time and more recent declines in the rates of forest loss. This estimate appears to have been first cited in 2006 by a Forest Conservation Officer at the Food and Agriculture Organization (FAO) Regional Office for Africa. Despite its validity being called into question in 2010 due to its use of data demonstrating a loss of forest cover at a suspiciously unwavering 165,000 ha every 5-year period from 1990–2010 [29], it was still being perpetuated in 2016.

An oft-cited comparison of maps of Malawi forest cover from 1979–1999 reveals a dramatic loss of forest cover over this period, but if any validity can be given to these maps, it appears that this dramatic change happened prior to 1990. Malawi lost 41% of forest cover between 1972 and 1990 at a 2.3% annual rate [6], and this loss of forest cover occurred almost exclusively on customary and private land [97] (as cited in [6]). Post-1990 declines in deforestation rates are being masked when including pre-1990 forest cover loss estimates. Applying the FAO forest classification system and Malawi Forestry Department data (found in Table 8.3 from the cited report), the average annual deforestation rate from

1990–2010 was <1% per year [29]. Another report produced in the same year claims that Malawi lost 0.85% per year or a total of 16.9% (659,000 ha) of its forest cover over this period [98]. The report does not cite the source of this estimate. It may be from the report above, and it is still less than the 1990–2010 1.6% estimate of the same period cited in the introduction of this paper. It appears that pre-1990 estimates of rapid deforestation using a different classification as FAO are being incorporated into more recent estimates and masking 1990–2010 decreases in deforestation rates.

It could be that the rate of deforestation in Malawi after 1990 declined simply because Malawi forests had already been diminished, and there was little forest left to lose. This would be most apparent in the central and south regions, where there is less forest cover. In Dedza district (central region), 1991–2015, almost half of the forest was lost, but it only had 2.6% forest cover in 1991. This was almost a 2% annual loss over this period, but there was not much forest area to lose [15]. This is also pertinent to the districts in the northern region where the Misuku Hills are located. Since independence, there has been a gradual migration of people to the northern region [37], and “it is these areas that have also experienced the greatest amount of deforestation since independence” [14] (p. 274). An 1972–2009 estimate found that Karonga (−579 km²; −28%) and Chitipa (−565 km²; −20%) were among the districts that experienced some of the greatest declines in forest area [14]. Again, this estimate included pre-1990 conditions that could be masking more recent reductions in forest cover loss. A hot spot of change analysis revealed that, while some districts in the northern region experienced significant forest and natural vegetation loss between 1990–2010, Chitipa and Karonga experienced almost imperceptible changes [5]. These are the data cited in the introduction of this paper as being the most methodologically rigorous and forthcoming.

The 1972–2009 estimate reveals that nationally “there was a loss of 12,760 km² (36%) of original forested area but also 11,161 km² of new forest establishment, resulting in a relatively modest overall net loss of 1599 km² (5%)” [14] (p. 269). The districts of Chitipa (+54%, +622 km²) and Karonga (+44%, +523 km²) were among the districts that experienced the largest percentage and net gains in mosaic land cover (defined as a mixture of cropland, forest, woodland, grassland, scrubland, and other natural vegetation). In fact, in every district that had an overall loss in forest, there was an overall gain in mosaic land cover. Of course, this calls into question the ability of the mosaic land cover to replace the losses to biodiversity and ecosystem services brought about by the loss of indigenous forest cover.

Other estimates of national forest cover reveal apparent swings. The Biomass Assessment of 1991 showed that, in 1973, “Brachystegia forests occupied 45% of total land area of Malawi (36.5% if Lake Malawi is included) while in 1990/91 land under forest cover was estimated to be 25.3% (20.5% if Lake Malawi is included)” [29] (p. 143). The trusted estimate cited in the introduction of this paper of 26.8% is within the range of other estimates (18.2 to 28.7%) of total forest land cover [99], and greatly underestimates another as high as 34% (3.2 million hectares) [29]. There has undoubtedly been a loss of forest cover since 1973, but there has also been a gain (or at least a stagnation) since 1990. The difference between the 45% estimate in 1973 and the 26.8% estimate in 2010 equates to a 40% loss, but this loss occurred completely before 1990. As cited above, Malawi lost 41% of forest cover between 1972 and 1990 [6]. This is highly contradictory to the 5% net loss cited above that takes into account regeneration and new forest establishment [14]. One explanation that could attempt to reconcile these estimates is that previous estimates did not take into account regeneration, but this is far from clear.

Despite all of the data discrepancies and the opaqueness of how they were derived, the most recent estimates are cause for measured hope. Since the decline in forest cover and deforestation rates coincides with the beginning of the slew of forest policies in the 1990s, the larger unanswered question is the degree to which forest policy interventions led to the apparent halting of deforestation.

The academic exercise and arguable futility in trying to untangle the web of past forest cover and loss estimates are currently being addressed in future plans.

As part of the process for developing Malawi’s National Monitoring Framework, the US Geological Survey (USGS) with support from USAID is developing national maps of land use and land cover, as well as maps documenting on-farm tree cover for baseline year 2017, the year the National FLR

Strategy was launched. These maps will provide data on the biophysical progress of FLR interventions in Malawi (e.g., percent of tree cover), which will serve to set a baseline for monitoring biophysical progress on the agricultural technologies, forest management, and community forest and woodlot restoration interventions [100] (p. 16)

These data are not just essential for forest monitoring, but also because they will inform other monitoring activities such as the Integrated Household Survey which considers community forests and woodlots in its assessment of local resources [100].

“In 2016, the Government of Malawi made a national pledge to the African Forest Landscape Restoration Initiative (AFR100) under the Bonn Challenge to restore 4.5 million hectares of degraded and deforested land by 2030” [100] (p. 3). Malawi has taken the bold step to not only make this pledge and have an increasing number of policies to support this goal, but Malawi now also has a 2018 framework to evaluate its progress towards reaching its pledge to “increase area of community forests and woodlots to 200,000 ha by 2020 and 600,000 ha by 2030” and “improve protection and management of 2 million ha of natural forest, restore 500,000 ha of degraded forest, and establish 100,000 ha of commercial plantations by 2030” [100] (p. 4).

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