Ethiopian Church Forests: A Hybrid Model of Protection

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Abstract Protection of forests because of their association
with religious traditions is a worldwide phenomenon. These
sacred forests play a key role in maintaining ecosystem ser-
vices in regions affected by land system change. In the north-
ern highlands of Ethiopia, the Ethiopian Orthodox Tewahido
Church controls the majority of the surviving native forest.
However, the reasons why communities value the forests
and the ways they use and manage them are not well under-
stood. We use data and analysis from an interdisciplinary pro-
ject and ethnographic research, in particular, to explain how
Ethiopian church forests function. Church forests represent an
unusual form of community-based protection that integrates
locally controlled common property with external institutional
arrangements: this hybrid system is highly effective at
protecting the forest while maintaining cultural practices.
Our results inform theoretical debates about models of tropical
forest protection and question assumptions about church for-
ests being the product of a nature conservation imperative.

Introduction

Upwards of 13 million ha of forest were degraded per year
between 2000 and 2010 (FAO 2010). Most of this change
occurred in the tropics. Achard *et al.* (2014: 2546) estimate
global tropical forest loss to be eight million ha per year from
1990 to 2000 and 7.6 million ha per year from 2000 to 2010.
Land uses linked to tropical deforestation – such as tim-
ber harvesting, pasture expansion, planting of tree cash
crops, and agriculture – are the product of a complex
web of variables ranging from national policies, rich
country consumption, and a host of remote influences
to local scale factors, such as population change, bio-
physical conditions, and institutions (Geist and Lambin
2002; Klepeis 2003; Roy Chowdhury and Turner 2006).

Along with advances in the understanding of deforestation
dynamics, a rich literature on ways to mitigate the driving
forces of change has emerged (Boucher *et al.* 2014). The push
for conservation is due to the many societal benefits that trop-
ical forests provide, such as livelihood opportunities, carbon
sequestration, pollination, and other ecosystem-based pro-
cesses (Goldman 2010). In addition to focusing on ways to
slow ongoing degradation a subset of the literature celebrates
community-based systems that have proven historically resil-
ient to the kinds of forces driving deforestation elsewhere
(Ostrom 1991). We contribute to this literature using the case
of Ethiopian church forests, which are good examples of sites
that have been protected through the agency of local commu-
nities. But the case does not fit neatly into existing theoretical
frameworks. Instead, our analysis offers a hybrid model of

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tropical forest protection that integrates locally controlled common property with external institutional arrangements.

Rooted in concerns about biodiversity and climate change (Bonan 2008; Bradshaw et al. 2009), governments often try to prevent access to forest resources by establishing formal protected areas (i.e., parks). But only 8% of tropical forest lies within park boundaries, and their effectiveness at preventing land degradation is mixed (DeFries et al. 2007; Laurance et al. 2012). In addition to the small area within parks, they normally represent forms of top-down, externally imposed land management. Without local involvement in developing a conservation model that aligns with concerns about livelihood, cultural integrity, and dignity, the result may be a "paper park" the boundaries of which are largely ignored by regional inhabitants (Waylen et al. 2010). Parks also receive criticism for embodying a "pristine myth" (Denevan 1992): they ignore the reality that most forested landscapes worldwide have been modified significantly by human activity (Williams 2003; Klepeis and Laris 2006); and they are often designed to "preserve" biophysical conditions rather than acknowledging the social construction of nature (Robbins 2012) and the ways in which social and biophysical "networks of agency" are at work in the creation of all landscapes (Head 2008).

In stark contrast to the parks model, community-based systems – including those involving common property – are forms of land protection celebrated for their potential in promoting sustainable land use and avoiding the weaknesses of top-down initiatives (Ostrom 1991; Worster 1993; Lawrence et al. 2004; Oldekop et al. 2013). Indeed, international institutions such as the International Union for Conservation of Nature (IUCN), the World Wildlife Fund (WWF), and the World Bank have been "popularizing a new discourse of conservation in which community-based management is thought to be a more democratic, equitable, collaborative, ecologically adaptive, and environmentally sustainable alternative to state management" (Ogbaharya 2013: 17–18). Most forms of common property protect a communal resource in ways that support the livelihood of community members; that is, the focus tends to be on uses that benefit society in some kind of material way (e.g., ecosystem services).

Effective management of common property depends on clear rules regulating resource use (Agrawal 2002; Gibson et al. 2005; Ostrom and Nagendra 2006; Mwangi and Ostrom 2009). The rules, often informal, determine the boundaries of the communal resources; they also specify whom, when, and to what extent those resources can be used. But the rules must be enforced. The absence of strong enforcement mechanisms – however clearly specified – may lead to resource degradation. Statistical analysis of 152 examples of community-based forest management in nine countries shows that "better local enforcement is associated with a higher probability of forest regeneration" (Chhatre and Agrawal 2008: 13,290).

Ethiopian church forests, a type of sacred forest, represent a third, hybrid approach to forest protection that incorporates elements of both the top-down "parks" and bottom-up common property models. Sacred forests – also known as sacred groves and fetish forests – are a worldwide phenomenon where, broadly speaking, forests are protected because they have "cultural or spiritual significance to the people who live around them" (Ormsby 2011: 783; see also Wild and Mcleod 2008; Pungetti et al. 2012). Conservationists celebrate them because they play a key role in maintaining both cultural and biological diversity in areas affected by land system change (Ramakrishnan et al. 1998; Byers et al. 2001; Bhagwat and Rutte 2006; Dudley et al. 2009; Wild and McLeod 2008; Cardelús et al. 2012).

In addition to informing theoretical debates about community-based forest protection and enriching the sacred forest literature, our research fills an important gap in understanding Ethiopian church forests. The bulk of research on church forests centers on ecological and forest cover conditions (Scull et al. 2016; Wassie 2002; Bongers et al. 2006; Wassie et al. 2009; Lowman 2010; Wassie et al. 2010; Cardelús et al. 2013; Daye and Healey 2015; Aerts et al. 2016). Understanding from the social sciences is sparse and what exists offers fairly broad-brush explanations of why and how church forests function (Berhane-Selassie 2008; Reynolds et al. 2015; Amare et al. 2016). To our knowledge, we present the first use of an ethnographic approach that exposes in detail the complex workings of church forest systems.

We begin with an overview of debates about deforestation in Ethiopia, emphasizing the country's north, the site of our study area. Within the context of a strong degradation narrative applied broadly to the country, national and international entities identify church forests as a critical barrier to the complete loss of native forest in Ethiopia. Understanding this degradation narrative provides important context for the role church forests play in the country's environmental history. After describing the research location and our methods, we weigh the evidence about deforestation and church forest conditions in the study area. Subsequently, our results are used to explain a hybrid model of forest protection, which is grounded in religious-based traditions, support from government and the Ethiopian Orthodox Tewahido Church (EOTC), and the local community's use of church forests as both graveyards and social spaces. The findings inform theoretical debates about models of tropical forest protection and hold implications for efforts to protect church forests based on a nature conservation imperative.

Background

The conventional wisdom is that deforestation in Ethiopia has been severe and began long ago (e.g., Lemenih and Kassa 2014). But how much native forest covered northern Ethiopia in the distant past is not well known, and assumptions about

baseline forest cover for any particular historical period or location should be made with caution (McCann 1997; Nyssen *et al.* 2014). New research using a mix of data sources, including pollen, charcoal, aerial photographs, repeat photography, and satellite imagery, is starting to paint a more detailed picture. At the millennial scale, going back 3000 years, forest clearing and regrowth (linked to both human activity and climatic shifts) is a common pattern (Darbyshire *et al.* 2003). Over the past few hundred years, flux in woody vegetation has been the norm as well. Indeed, countering a Malthusian assumption that population growth necessarily leads to forest degradation, Meire *et al.* (2013) and Nyssen *et al.* (2014) find that woody vegetation in northern Ethiopia expanded between 1868 and 2008 even as population grew.

Whether involving clearing or regeneration, historical changes in forest and woody vegetation cover in northern Ethiopia are not linear. And variability in settlement and land use patterns is linked to variation in the spatial patterns of degradation and recovery. Analysis of native tree cover since 1868 shows that it peaked in the 1930s, declined abruptly, and then recovered to levels akin to what was present in the 1860s (Nyssen *et al.* 2014: 171): "Through repeated photography, our analysis shows that the recent status (2006–2011) of the examined environmental indicators is better than it was in earlier decades, second only to the 1930s for woody vegetation when not including *Eucalyptus*" (ibid.: 173). That there is temporal and spatial variability in vegetation cover is not surprising; forest change is normal (Williams 2003). Greening seems to be connected to improvements in land management, such as the use of stone bunds (low walls) along contour lines (Frankl *et al.* 2015), the "closing of strongly degraded areas to livestock, cultivation and indiscriminate tree felling" (Nyssen *et al.* 2009: 2753), and afforestation and reforestation programs (Jagger and Pender 2003: 4–6). Nyssen *et al.*'s (2014) finding that society has responded well to what was often severe land degradation, such as gully erosion, speaks to the adaptive capacity of people in northern Ethiopia and the need to take care with assumptions about land conditions past and present.

Many natural resource conservation strategies began in the 1960s, and then were expanded under the Marxist-Leninist Derg Regime (1974–1991). For example, the State Forest Development Agency was created in 1964 and tree nurseries became established around the country, including in the northern Amhara region (Ayele 2014). Initially, seedlings were distributed free of charge. Subsequently, the Derg implemented land reforms that abolished the feudal system of land tenure (Jagger and Pender 2000: 4). The regime then established the Community Forestry Development Department (CFDD), which worked with Peasant Associations to create large-scale forest plantations (Poschen-Eiche 1987). The Derg environmental legacy is mixed, however. Not only did the plantations consist of largely non-native species, the reforms led to instability in land tenure, and undermined smallholder control

over particular parcels of land; these dynamics often created disincentives for individual farmers and herders to invest in sustainable land management (Hoben 1996: 192).

In 1976 the government banned the export of all forest products (excluding tree sap used for incense) and the newly organized Ministry of Agriculture and Forest Development identified areas exposed to erosion and facilitated tree planting there, including *Eucalyptus globulus* (*Myrtaceae*, Ayele 2014). Following the outbreak of famine in the 1980s, the government embarked on a number of reforestation initiatives. For example, there was a "food for work" program, which gave laborers wheat and edible oil as payment for planting trees (Ayele 2014). "Firewood Development Projects" planted less agriculturally productive sites with trees (Ayele 2014). In addition, with concern about land degradation as a factor undermining food security, international non-governmental organizations (NGOs) and federal officials collaborated to plant trees on some 300,000 ha, mostly in community woodlots (Hoben 1996).

Just as there is debate about the degree of deforestation in Ethiopia, there is considerable debate about tradeoffs between economic and environmental impacts of the *Eucalyptus* boom (Matthiesa and Karimovb 2014). The United Nations, the African Development Fund, and the World Bank have all promoted the use of *Eucalyptus* in Ethiopia (Pohjonen and Pukkala, 1990; Stiles *et al.* 1991 cited by Jagger and Pender 2000: 5). While introduced around Addis Ababa in the late nineteenth century, *Eucalyptus* was not common in northern Ethiopia until the Derg period (Teka Belay *et al.* 2014), although *Eucalyptus* plantations are now a prominent feature of the landscape. *Eucalyptus* is fast growing, resilient, and holds great economic value (Jagger and Pender 2003). But the tree may threaten the regeneration of native forest due to its negative effects on groundwater and soil fertility (Fritzsche *et al.* 2006), and it decreases maize yields within a circumference of 20 m (Chanie *et al.* 2013). Farmers recognize that *Eucalyptus* reduces agricultural productivity and may affect water access, however "they continue to plant the trees because of the relative short time required to produce wood biomass for fuel, construction and cash" (Chanie *et al.* 2013: 28).

In sum, the history of land system change in northern Ethiopia does not fit neatly into either a deforestation or recovery narrative. The story of church forests in this history is also open to interpretation.

Methodology

The South Gondar Study Region

Our case study draws on data and analysis from an interdisciplinary project studying forest patterns, use, and change dynamics in the South Gondar Administrative Zone of the Amhara Regional State (Fig. 1). Church forests exist
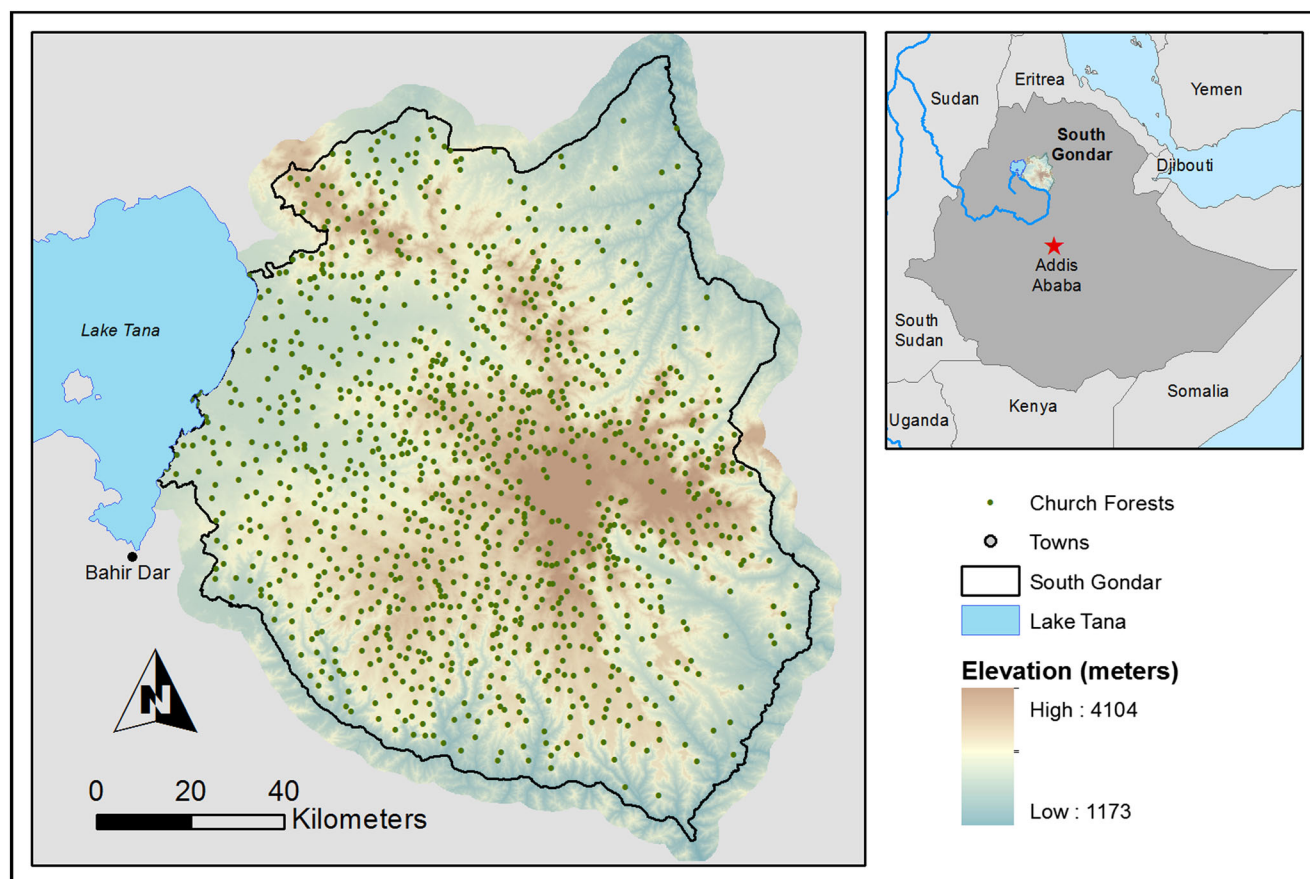
Fig. 1 Location of the study area in the South Gondar Zone, Amhara Regional State, Ethiopia

throughout Ethiopia. The Gamo Highlands in the southwest and the Lake Tana region in the north receive particular attention in the scholarly literature (e.g., Wassie 2002; Bongers *et al.* 2006; Berhane-Selassie 2008; Daye and Healey 2015). We focus on South Gondar in the country's northern highlands for three reasons: over 1000 church forests contain the highest tree diversity in the region (Cardelús *et al.* 2013; Reynolds *et al.* 2015); our socio-ecological line of inquiry builds on the significant body of ecological research on church forests there (e.g., Wassie 2002); and pressures on church forest integrity have attracted national and international attention in the study area (Lowman 2010; Cardelús *et al.* 2012).

Located to the east of Lake Tana (the largest lake in Ethiopia), the landscape of South Gondar is dominated by agriculture, rangeland, and *Eucalyptus* plantations. The topography is variable, particularly in the eastern part of the region, with steep slopes common. The church forest type is dry afromontane, and the region has a mean annual rainfall of 1216 mm, with a distinct wet season from June to August (Wassie *et al.* 2009). Twenty-nine church forests make up our sample, which is representative of variability in regional geography – including montane (1700–2100 masl) and upper montane (2410–2800 masl) sites – church forest size (ranging from 2.6–42.6 ha), and proximity to urban areas. The
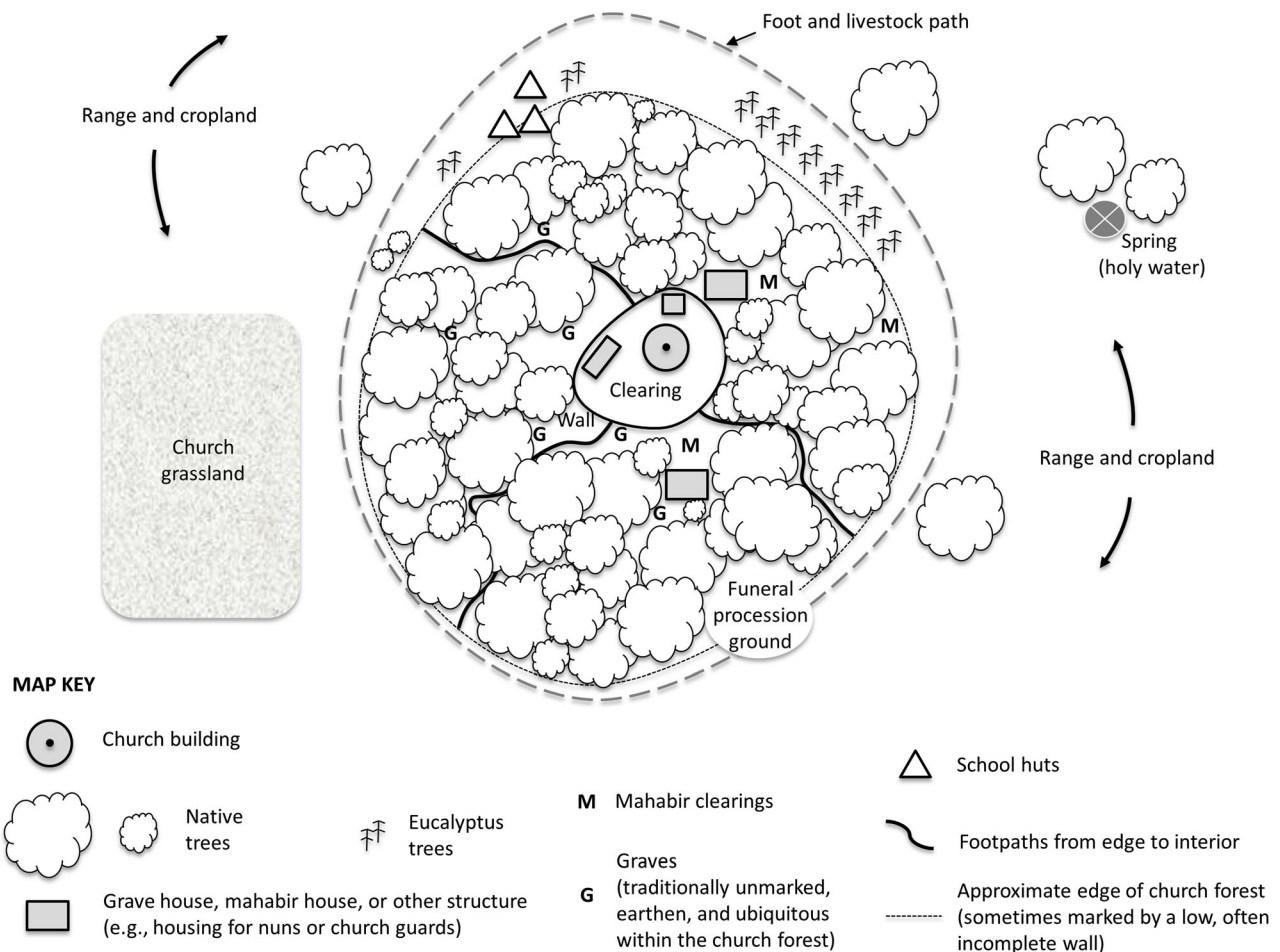
component of the multidisciplinary project that involves collecting and analyzing ecological data is described elsewhere (Cardelús *et al.*, n.d.).

Forests are an integral part of the Ethiopian Orthodox Tewahido Church (EOTC), which likely originated in the fourth century AD (Wassie 2002). A ring of forest surrounds most churches (Figs. 1, 2 and 3). It is unclear when the tradition of having a church surrounded by forest began, but thousands of church forests have persisted on the landscape despite dramatic shifts in social conditions (Bongers *et al.* 2006; Cardelús *et al.* 2013). The FAO (2010) estimates that 40,000 ha/year were deforested in Ethiopia from 1990 to 2010. While evidence of widespread land degradation is mixed, what is clear is that church forests protect some of the last native forest in South Gondar (Cardelús *et al.* 2013), contain many of Ethiopia's endangered plant and invertebrate taxa (Bongers *et al.* 2006), support the highest richness of tree species in the region (Aerts *et al.* 2006; Wassie *et al.* 2010), and provide a range of social benefits to community members.

Field Methods

In-depth, open-ended interviews were conducted with church forest priests, nuns, and guards in October 2013 and January

MAP KEY

⊙	Church building		△	School huts
☁	Native trees	⸙ Eucalyptus trees	M	Mahabir clearings
▢	Grave house, mahabir house, or other structure (e.g., housing for nuns or church guards)		G	Graves (traditionally unmarked, earthen, and ubiquitous within the church forest)
			∿	Footpaths from edge to interior
			---------	Approximate edge of church forest (sometimes marked by a low, often incomplete wall)

Fig. 2 Simplified sketch map of common features in an average church forest. Note that there are often gaps in the canopy closure and the presence of large, native trees near the church forest may make it hard to determine a definitive perimeter. Springs used for holy water are sometimes found within the church forest, but more commonly are located outside of it, often many hundreds of meters away. Church controlled grasslands are normally adjacent to the church forest, but may be located hundreds of meters away as well. In a 30,000 km² swath of South Gondar, we identified 1488 church forests with an average size of 5.2 ha (± 0.44) and on average 2.1 km (± 0.03) separating one forest from another (Cardelús *et al*. 2013)

2014. These site visits included guided walks – usually led by priests and informed by our use of aerial photographs – which enabled us to document physical features of the church forest system (Figs. 2 and 3). Subsequently, from March to April 2014, ethnographic research was conducted in Amharic with members of five communities: interviews included male and female respondents of different ages and professions (e.g., farmers, shopkeepers in nearby towns), clergy (priests, deacons, nuns and monks), church schoolteachers, and authorities at the local and regional levels. Each interview was recorded and transcribed. In addition, the fieldwork was scheduled around important events, which allowed for observations of how congregations use church forests and corroboration of evidence gleaned from interviews.

The inductive process that underpinned the ethnography exposed the importance of church forests as both religious and social spaces, and suggested social capital (i.e., social relations that lead to community cohesiveness and cooperation for mutual benefit) as a key factor in forest protection (Wilson 2012). Starting in November 2014, over the course of three months, a total of 157 semi-structured interviews (including 50 women) were conducted at 23 sites in our sample. Building on the ethnographic work, these interviews exposed the roles and perspectives of key voices in community decision-making, both those explicitly charged with protecting the church and the forest and average community members of different ages and backgrounds. The interviews explored the spiritual and utilitarian functions church forests play in the community, the 'rules' of forest use and sanctions for violating them, the reasoning behind forest management initiatives (e.g., the decision to plant *Eucalyptus* or build a wall around the forest), and the relative importance of land tenure change on church landholdings.

Fig. 3 Aerial photograph of a church forest (7.2 ha in size) in South Gondar, Ethiopia. Note the presence of two churches, which is becoming more common as wealth grows and external benefactors donate money to local communities

Results: Debating Forest Change in South Gondar

The kind of spatially explicit mapping of historical forest cover being generated elsewhere in northern Ethiopia is only starting to be produced for South Gondar. Respondents in the region argue overwhelmingly that there was more native forest some 50 years ago than exists now. In one example, an elderly community member explained how he had played in thick, native forest in an area now completely cleared. Such oral histories should be taken with caution, however. We recognize the degree to which a deforestation narrative has been adopted as conventional wisdom among much of the population, even when there is clear evidence to the contrary. For example, in a study of forest change in Tigray Regional State that draws on historical photographs, Meire *et al.* (2013: 735) note:

> … the inhabitants told us that "at the time of our grand-parents everything was forest here." When we showed the 1868 photographs depicting a much poorer woody vegetation cover than the actual landscape, they simply did not believe it.

It may be that respondents are correct in their recollections, however. Our ethnography demonstrates that translations of the term "forest" may not be clear. When people say there was more "forest" in living memory they may mean more "natural" or thicker vegetation even if it does not represent trees. Recent research by Scull *et al.* (2016) seems to corroborate this notion. Comparing aerial photographs from 1935 and today, they find that forest (i.e., tree) cover in the landscape surrounding church forests is largely unchanged – that is, there was not more forest on the landscape 80 years ago than there is today (when not considering *Eucalyptus* plantations). But there was significantly more "bushland" (i.e., woody biomass, such as shrubs). Respondents may be referring to there being denser wildland or "bushland" years ago as opposed to forest, *per se*.

In addition to claims about forms of land degradation affecting the broader region, many scholars, NGOs, and government agencies hold that historically strong church forest protection is now weakening in South Gondar and requires intervention (Bongers *et al.* 2006; Wassie and Teketay 2006; Lowman 2010; Reynolds *et al.* 2015). The concern about

church forest status has stimulated a mix of ongoing conservation initiatives. For example, the TREE Foundation (2015) has been funding the construction of walls to keep out livestock, UNESCO's Man and the Biosphere Programme established the Lake Tana Biosphere Reserve in 2015 (zur Heide 2012; NABU 2015), and the Ethiopian government is pressuring local communities to do more to protect church forests (multiple respondents in South Gondar note that they have received letters from government officials imploring them to protect the cultural heritage church forests represent).

Our research supports some of the concerns about church forest vulnerability, although there are clear signs of resilience as well. There are 1488 church forests in a 30,000 km^2 swath of the South Gondar region (Cardelús *et al.* 2013). Consistent with scholarship that questions an Ethiopian deforestation narrative, church forest size along this east-west transect is relatively stable (averaging around 5 ha) and, indeed, may even have increased between 1962 and 2012 due to the growth of *Eucalyptus* plantations along forest edges (Cardelús *et al.*, n.d.). While forests persist there are indicators of degradation, however, including an average decrease of 16.9% in crown closure (i.e., an increase in canopy openness) (Cardelús *et al.*, n.d.). And Scull *et al.* (2016) find that a decline in bushland surrounding church forests in South Gondar may threaten their ecological integrity. In other words, even if forest cover is being maintained there may be processes compromising the ecological status of some church forests.

Stepping back and reading the larger South Gondar landscape today, features that suggest the region was more forested in the past are apparent. First, stand alone large trees are common outside of church forests, although native trees are often planted near them to increase the social standing of the church and may not be remnants of a more expansive native forest (Berhane-Selassie 2008: 106, Fig. 4). Second, biodiverse church forests exist when few native trees appear anywhere else. Third, there is no evidence that people planted the church forests. It is likely that they existed on the landscape long before 1935, the earliest year for which we have aerial photographs (see Nyssen and Petrie 2013 and Scull *et al.* 2016). Explaining how church forests function is, therefore, both a celebration of what we assume to be centuries-long protection of forest by local communities as well as an opportunity to evaluate the system for lessons about sustainable land management.

Results: The Church Forest System

Church forests are an intrinsic part of socio-religious practice for Orthodox Christians in northern Ethiopia. There is little evidence of active, strategic management of the forests as natural resources, however. Indeed, it is not the forest that is the object of protection or worship. While they are an integral part of community life church forests are not spaces protected to maintain biodiversity or ecosystem services, and they do not support any community member's livelihood (save for a handful of people who live or work in the church forests – clergy, nuns and monks – who are supported indirectly).

Instead, the space within and near the church building – a sacred geography that includes the forest – is a key part of the socio-religious lives of the people. The communities protect the forests as a by-product of religious practice and values (Table 1). We describe the church forest system by referencing its sacred geography. Starting with the church itself and then working towards the forest edge, we explain how people value the forest, features and activities that take place in particular sections of it, and the ways the forest is a product of both "top-down" hierarchical and "bottom-up" community-based governance. All members of the church forest community are members of the local EOTC congregation.

The Church and Inner Clearing

The EOTC, as sanctioned by the federal government, allows local communities to have access and control over the land occupied by church forests. Similarly, prior to modern land tenure arrangements (which started to be formulated after the Derg regime came to power in 1974), Ethiopia's imperial states sanctioned church land control. Churches and the surrounding forest are managed by Church Councils (*Sebeka Gubaye*) consisting of priests and lay members. They are joint 'judicial' bodies representing the agency of both church leadership and the community. The Council's main focus is the socio-religious life of the community, such as making sure that mass services are offered to the congregation, priest salaries are paid, and funding is available for church renovations. Funds come primarily from regular (mandatory) donations to the church by community members, the sale of grasses or *Eucalyptus*, and donations from external benefactors.

The leadership of priests is essential to governance. Though they are not necessarily wealthier than the average community member, priests enjoy an enormous amount of prestige by virtue of their role as mediators between 'heaven and earth' and their centrality to community life. For example, community association meetings (*mahabirs*, see Table 1 and below) cannot take place without the presence of the clergy. Moreover, the sacred knowledge of the EOTC is encoded in a language (Ge'ez) known only to those with church education, although a modernist push for use of the vernacular within the church means more literature is now available in the local language (Amharic). Important to the flow of information between priests and the congregation is the fact that priests are also farmers, have their own families, and live in the community.

While sacred forest communities in other parts of the world often view the trees themselves as sacred (Pungetti *et al.* 2012) in Ethiopia this is not the case. Some respondents say there are

Fig. 4 A church forest near the town of Mekane Eyesus in South Gondar, Ethiopia. Church forests are normally located on hills. Note the native scattered (i.e., stand-alone) trees distinctly outside of the forest perimeter, young *Eucalyptus* plantations at the church forest edge, and cattle grazing right next to the forest
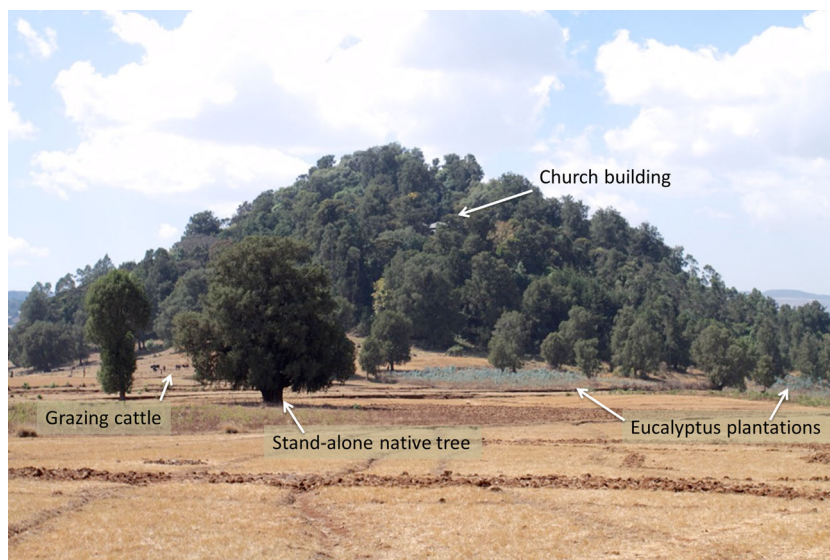
divine beings residing in the forest, but they note that if the forest were to disappear the beings would find someplace else to live. Instead, the church forests gain their special status due to the presence of something perceived as divine: at the very center of each church building there is a *tabot*, which is believed to be a replica of the original Ark of the Covenant. The *tabot* is both a potent signifier and material embodiment of the Church as the mediator of divine grace. As such, it is often used synecdochically to represent divine authority, wrath, or mercy. The sanctity and divinity of the *tabot* is thought to radiate outwards from the church. The proximity of the *tabot* dictates the rules of the sacred geography of the entire church compound, including the forest; the closer one is to the church the more divine the space.

Relative proximity to the church building (and the *tabot* within) is linked to rules that allow or prevent certain uses and activities. For example, the inner circle or clearing (largely absent of trees) forms a smaller compound around the church, and is a place for rituals such as a *tabot* procession (Fig. 5). The physical space is delineated in symbolic ways (e.g., the distance from the church to a wall surrounding the inner clearing is supposed to be 40 arm lengths of an angel). Presence within the clearing requires forms of "purity" be met; people who have recently eaten or had sexual relations are considered too impure to enter, as are menstruating women.

In addition to the church building, the inner circle normally contains other structures that may provide housing for nuns and guards or contain church "treasures" (i.e., documents, artifacts, or other church materials). Monks and nuns are often permanent dwellers in church compounds. They are rarely individuals who have devoted their lives to religious learning; on the contrary, they are ordinary men and women (often widowed) who in most cases have lost their livelihoods. Service to the church and life in the church forest offers them a dignified and socially accepted solution to their difficult circumstances.

Inner Periphery

A wall rings the clearing that surrounds the church. The wall demarcates the most sacred space near the church from the progressively less sacred space between the inner clearing and the forest edge. Beyond the inner clearing the land available for burial grounds begins (although some clergy may be buried within the clearing); the spaces closer to the church and the *tabot* are the most desirable. Until relatively recently, graves were covered with earthen mounds and the site reused through time (Fig. 6a). More recently, concrete headstones and structures (i.e., "grave houses") protecting the gravesite have become more common (Fig. 6b). Funeral parties use the space in the church compound for ritual purposes, and special prayers take place in the forest before the body is buried. Community members also use the forest for events such as christenings or anniversaries of deaths. Our ethnographic research thus reveals that one of the most important uses of the forest is as a proper burial site, or cemetery, by virtue of its physical proximity to the *tabot*, the material symbol of God's power to forgive the sins of the deceased.

The Main Forest

In general terms, the forest is a form of symbolic protection: it provides respectful 'cover' or 'clothing' for the church. This significance is reinforced by many other cultural artifacts that serve within Ethiopian Christianity as respectful "cover," such as the white robes worn by congregants when they attend church and the ornate umbrellas used to cover the *tabot* when it is taken out in procession (Boylston 2012). When asked about the importance of what scientists would call a dense, closed canopy as compared to one that is thin and more open respondents commonly use an analogy: anyone would love to

Table 1 Material and non-material uses or benefits church forests provide to community members

	Description
Material Use*	
Construction	Trees may be cut and used to build churches or associated structures that serve the church.
Fuelwood	Used by nuns or guards to feed themselves, prepare food served as part of a church service, or for priests.
Holy water	A spring or other water source found within or near the church forest, which has been blessed as holy water and used for its purported healing properties.
Natural resource for sale	Native trees may be cut and sold as long as the money benefits the church. Grasses and other species may be sold for church income as well. In recent decades, it is common for churches to plant *Eucalyptus* trees as a cash crop and sometimes to demarcate church landholdings.
Shelter	Nuns and monks often live in the church forest, and forest resources such as fuelwood support them. In addition, the traveling poor are welcome to seek food and shelter within the church forest (even sleeping in grave houses is acceptable).
Non-Material Use#	
Burial ground	The forest is akin to a church cemetery; people wish to be buried near the sacred *tabot*. Traditionally, burial sites with earthen graves are reused, although the practice of using concrete to mark graves has become common in recent decades as has the use of structures (built of *Eucalyptus* and corrugated iron, called "grave houses") to demarcate and protect gravesites.
Funeral procession ground	An open field found on the edge of the church forest used during funerals.
Mahabirs	Associations made up of sub-groups of the church congregation, which are affiliated with a particular patron saint. Each *mahabir* gathers regularly in specific spaces, usually in a small clearing under the shade of large trees; these *mahabir* clearings are scattered throughout the forest. In recent decades, structures built of *Eucalyptus* and corrugated iron ("*mahabir* houses") have become more common as gathering spaces.
Prayer and contemplation	School children and others often spend time in the forest.
Rituals	Many religious rituals are undertaken within the inner clearing or circle.
School grounds	Most church forests contain an area devoted to a church school located along the forest edge.

*Defined as an alteration to biophysical conditions within the church forest or the use of a natural resource to provide shelter to forest inhabitants or economic benefit to the church

While burial grounds and *mahabirs* traditionally represent non-material uses of the forest, new trends involving the use of protective structures may be altering biophysical conditions

have nice, fancy clothes, however, if you cannot afford them then you at least want to have some clothing on. While community members tend to prefer a dense forest, many noted that a "shabby" forest is better than none: "if there was no forest, the church would be naked." In most of the forests we visited, the forest canopy was uneven (Fig. 2).

Community members explain that the forest should be protected because "it belongs to the church:" to cut the forest or graze livestock there is "like stealing from the church." The status of the forest, its role in the community, and the fact that it simply "belongs to the church" are meant to be strong deterrents to breaking rules, which do not allow cutting of trees, grazing livestock, or use of forest resources for any type of private or individual benefit. It is allowed, however, to cut native trees or sell cash crops planted within the church forest if it benefits the church in some way. Monitoring strategies are

not elaborate, although the idea of sanctions exists. But enforcement of these rules, and the implementation of sanctions, is rare. This situation sets our case study apart from a pure common property model, which assumes strict implementation of sanctions and rules regulating access to forest recourses.

The main form of transgression is via livestock – normally watched by children – wandering into the forest. Since church forest function relates primarily to religious practice, the punishment for disturbing the forest is perceived as an issue between the transgressor and god. The so-called *wugz* is a curse that might befall someone for "mistreating" the church forest. The curse is meant to result in a sudden acute accident, such as loss of sight or even a death in the family, although none of our respondents knows anyone who has been cursed. Similarly, the possibility of financial sanctions or dismissal from the

Fig. 5 The inner clearing surrounding a church near the town of Mekane Eyesus in South Gondar, Ethiopia. The structures at the clearing's perimeter serve as *mahabir* houses or housing for nuns and monks

congregation for breaking rules exists: however, none of the respondents knows of anyone having been dismissed, fines are quite small, and few respondents know anyone who has ever paid a fine. Furthermore, forest guards tend to be elderly

Fig. 6 A primary function of church forests is to serve as a cemetery. Traditionally, **a** earthen mounds mark sites that are reused through time, however, **b** concrete markers and "grave houses" are now common

people who spend most of their time in immediate proximity of the church building rather than patrolling the forest and monitoring who is accessing it. Regardless, the main focus of guards is to protect the church and its contents rather than the forest. The most common penalty for disturbing the forest is being required to offer a public apology to the congregation. Afterwards, the head priest usually grants a pardon.

Forest Periphery

There are normally multiple access points to the church forest with footpaths leading from the forest edge to the inner clearing. Meeting and funeral procession grounds, schools, *Eucalyptus* plantations, and an outer wall are other key features along the periphery (Fig. 2). Beyond rituals, church forests provide the community with gathering spaces where activities and community events take place. Association meetings (*mahabirs*) are the most important of these events. They celebrate a particular patron saint, who blesses association members, but they are also social gatherings during which people eat and drink traditional beer. *Mahabirs* serve as a support network for individual community members in times of need. Their regular meetings in forest clearings facilitate the emotional attachment people have to church grounds; the forests provide a contemplative environment in a shady spot and serve as a kind of community center. Each church forest congregation may include multiple (as many as 12 in one study site) *mahabirs*, each with its own meeting area. These areas are usually located along the edge of the forest, although some are located closer to the inner clearing. In addition to "*mahabir* houses" (Table 1), it is increasingly common to build a small structure in which local beer is produced at the edge of one of the meeting areas.

Some communities hold Sunday school in the forest, and most church forests host a religious school for the training of priests, with the community supporting the students (e.g., with food). The simple thatch huts of the students, which they build themselves, are located on the forest edge (Fig. 7). Normally, a young male teacher serves as an instructor to all male students, who use the edges of the forest for prayer, study, and leisure. Also, with no facilities within the compound, there is evidence that parts of the forest are used as toilets.

It is unclear how much planting of native trees occurred in church forests in the distant past. Certainly, Church Councils have taken advantage of government planting programs over the last few decades. Native trees are planted now and again, but churches have largely followed the regional trend and planted *Eucalyptus* within or along the edge of the forest. Native grasses and *Eucalyptus* are the most common cash crops, but some local government authorities also encourage the cultivation of coffee, avocado, and fruit trees.

The Derg as well as subsequent governments have redistributed some church land in South Gondar; that is, some churches have lost access to part of their land. There have also been cases, however, where churches gained land on the fringes of their forests to compensate for lands confiscated farther away. These redistributions create 'confusion' and opportunities for peasants to try to appropriate church land. Church communities have responded to this instability in multiple ways. For example, beyond providing income, construction material, and fuel wood, planting *Eucalyptus* along the forest edge demarcates church lands. In addition, many churches build a low wall. Both the walls along the forest periphery – usually incomplete and often too low to prevent cattle from entering the forest – and *Eucalyptus* stands are thought to discourage encroaching farmers. That said most local community members fully support the church and will offer free labor for planting or building walls for the churches. Some also donate land.

Beyond the Periphery

The average church forest has adjacent cropland and rangeland (Figs. 2 and 3). A network of well-worn foot and livestock paths ring the forest. Traditionally, church land outside the forest has been used to grow economically valuable crops, such as grasses commonly used in construction. Most churches have a source of holy water (and in one case holy honey), which is usually located outside the forest and is sought by pilgrims for its purported healing properties.

Discussion: A Hybrid Model of Forest Protection

Church forest cover has been maintained in South Gondar for hundreds of years because of a hybrid model of protection that integrates locally controlled common property with external institutional arrangements. The forest – a form of common property – exists because of a largely informal indigenous protection system based on the community's shared religious values and traditions. But local control is ultimately enabled by two external entities: the EOTC, which promotes the tradition of church forest protection; and the Ethiopian government, which sanctions church control over what is, in essence, state-owned land.

The hybrid nature of the church forest system is fundamentally about two modes of "ownership" or control, one local and "bottom-up" – community common property (we avoid reference to common "pool" resources because the term common "property" more clearly focuses on the mode of control and management, which is our concern) – and the other

Fig. 7 Religious schools for boys are located at the perimeter of most church forests. The students construct out of *Eucalyptus* the primitive huts that serve as their housing

ultimate ownership or control by external institutional entities ("top-down"), which includes both the Ethiopian state and the EOTC. Private property is the third available regime, but this is not applicable to church forest land, which is owned by the state and controlled by the Church rather than any individual.

The church forest case also highlights integration of conservation and preservation imperatives. The interests central to conservation (most nature-society scholars understand the term to reference utilitarian and livelihood-based uses) are often supposed to be better served by common property, and those central to land preservation (most nature-society scholars understand the term to reference non-material-based uses) by state property (see Klepeis and Laris 2006). The protection of church forests represents a hybrid of the two: indeed, both conservation and preservation interests seem to be better served than they would be by either a pure common property or a "parks" model alone.

In spite of exposure to multiple government land reform initiatives, great regional demand for timber and fuel wood, and pressure from farmers and herders to appropriate land, local communities continue to protect church forests. Our findings reinforce lessons of the sacred forest literature by showing how church tradition as well as non-material and supernatural imperatives are important in forest protection. But we also show how church forests represent a form of community-based forest management that incorporates utilitarian uses. Three examples highlight how church forests reflect both a preservationist, parks model of protection as well as one that incorporates elements found in common property systems.

The first example involves *land tenure*. Despite land reform under multiple governments, the Ethiopian government continues to recognize the historical control of church forests by the EOTC. Accordingly, church traditions and edicts dictate how the forests are used. But regular attempts at land reform since the 1970s underscore ways in which church forests are also forms of common property. The land reforms stimulated adaptive responses from local communities in the form of political maneuvering (e.g., lobbying local government to avoid having church land redistributed or to expand church land to increase space for burials) or creating physical demarcations in the form of walls or stands of *Eucalyptus* (built and planted by volunteer community labor and organized by priests). Local communities have agency, in other words, and protect local control of forest and church land; they do not passively accept government intervention. Interviews with top church administrators reinforce the finding that local communities have great flexibility in how land is managed.

Second, parks are often perceived as places where *nonconsumptive* activities occur; actions that involve material modification of forest are against the rules. In ways similar to nature preserves ("take nothing but pictures, leave nothing but footprints"), local communities protect church forests primarily because of non-material benefits, such as the provision of gathering places, sites for conducting rituals, burial grounds, and most importantly as a symbolic (and perhaps physical) form of protection for the sacred *tabot*. But – akin to common property systems – church forests are also managed for the material benefits to church officials and members of the congregation (Table 1).

Third, while the origin of the *forest protection tradition* within the EOTC is not clear, the imperative to protect church forests is reinforced through religious norms and church hierarchy. But local communities decide the degree to which forests constitute protected areas. And it is not solely fear of the supernatural or church authority that prevents community members from degrading forest resources; it is their respect for the church, the pride they feel for a "well clothed" church, and the material and non-material benefits they receive from the forest.

These three examples of ways in which church forests represent a preservation–conservation hybrid expose the importance of clearly defined boundaries of forest use and control. The system also gives communities agency over the forests with minimal interference from external actors. The interaction between priests and community members via *mahabirs* helps maintain the long-standing religious norms of forest protection. In addition, priests live within the community and work with community stakeholders to protect the benefits that church forests provide. Indeed, church forests provide the social space that enables the "networks of interaction" fundamental to maintaining close-knit communities and strong social capital (Wilson 2012: 5, 23).

Conclusion

As a global phenomenon, the potential for strong religious-based stewardship of forests is well established. There is growing recognition of the importance sacred forests play in protecting cultural and biological diversity – including attention from the United Nations Educational, Scientific, and Cultural Organization (UNESCO 2005) – although, assumptions about how they function are often simplistic. The first wave of scholarship on sacred forests conceptualized them as remnants of old growth vegetation preserved through the maintenance of "traditional" beliefs and practices (Chandran and Hughes 1997; UNESCO 2005; Dudley *et al.* 2009). For example, Gadgil and Vartak (1976) argued that fear of supernatural sanctions limited human exploitation of sacred forests in India allowing them to serve as *refugia* for endangered taxa. But recent scholarship shows that they are also the product of utilitarian use and adaptive maintenance of cultural identity (Dove *et al.* 2011; Kent 2013). Sacred forests are dynamic.

They are not mere relics from the distant past, but actively managed socio-ecological systems (Sheridan and Nyamwera 2008; Bhagwat et al. 2014).

While conservationists often assume that the communities who maintain sacred forests have a land stewardship ethic that prioritizes the preservation of biodiversity and forest cover, the reality is more complex: sacred forests are the product of a diverse mix of socioeconomic, political, and religious factors (Berhane-Selassie 2008; Sheridan and Nyamwera 2008; Maddox 2009). In other words, as is the case in Ethiopia, religious-based traditions may lead to forest protection, but the values underpinning the protection may have nothing to do with an ecological ethic rooted in concern about biodiversity, watershed management, or dryland degradation. We argue that explaining the church forest system requires invoking earlier interpretations about sacred forests, and ways in which centuries-long traditions and deference to the church protects forest. But the case also incorporates more recent interpretations of sacred forests, which position forest protection in terms of adaptive management and the product of shifting socio-ecological relationships.

EOTC forests are part cemetery and part community center. Forest use is carefully regulated not for "environmental" reasons (although ecosystem services are, indeed, provided even if people do not focus on them); rather, forest cover is protected because it supports socio-religious values. Increasingly, however, as the region undergoes socioeconomic change, access to building materials is becoming easier (e.g., *Eucalyptus* poles, metal roofs, concrete). In addition to *mahabir* houses, traditional earthen burial grounds are being replaced by built structures to protect gravesites. These new structures constitute a more permanent disturbance than in the past, and our ongoing research is investigating the ecological impacts these "grave houses, " gravestones, and *mahabir* houses are having on the forest's regenerative capacity.

Throughout history, sacred groves worldwide have been exposed to social and biophysical changes. In recent decades, many sacred groves have been threatened by population growth and associated demand for natural resources, social inequity, poor or no governance, political corruption, and government policies that encourage unsustainable land use practices (Dudley et al. 2009). In a study involving 33 countries, Bhagwat and Rutte (2006: 522) find that "in many countries local traditions are being challenged by westernized urban cultures, so that the institution of sacred groves is losing its cultural importance for the younger generations of local people." Osuri et al. (2014: 194) find that Indian sacred groves are under threat due to "weakening local institutions, diminishing cultural importance and growing demand for forest land timber and other natural resources." Similar to our suspicions about the impact of grave houses, *mahabir* houses, and other built structures, Hughes and Chandran (1997) find that degradation of Indian sacred groves is often driven by

changing cultural and religious sensibilities that assign more value to built structures than to trees.

Change dynamics in Ethiopia reflect those occurring elsewhere. Since the 1960s, there are many changing social conditions that potentially affect church forest communities: among the most noteworthy are the threat of encroachment by farmers and herders, a boom in the *Eucalyptus* economy, road improvements, political change and associated diversification of religious faiths, economic stratification, and, perhaps, new attitudes about status within church communities (e.g., capacity of some to construct expensive grave houses and headstones). In addition, forces of modernity may be affecting the attitudes of the younger generation for whom church forests seem to be of lesser value than they have been to their parents.

Despite the pressures they face church forests demonstrate remarkable resilience. Exposing the hybrid model of church forest protection informs debates about forest protection within and beyond the study region. Regionally, arguments for the protection of church forests based on a nature conservation imperative invoke a value that is largely absent in local communities. Instead, communication with church forest communities should be grounded in an appreciation for the sacred geography of church forests, and the range of material and nonmaterial benefits they provide to the community. And for debates about forest protection in other parts of the world, the Ethiopian case – while representing a unique rationale for protection – provides an example of the effectiveness of community-based natural resource management.

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