

## REVIEW



# Forest Policy of Ethiopia from 1990 to 2020: An Assessment of Contemporary Forest Management Approach and Its Impact on Local Livelihood

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**Abstract:** This paper reviews historical perspectives on deforestation, forest law and policy, and participatory forest management (PFM) in Ethiopia. The main aim of this review was to state historical trends in forestry policy and forestry laws since the 1990s as well as the impacts of PFM on forest status and local community livelihoods in Ethiopia. To achieve the objective, the paperwork reviewed theoretical concepts from many scientific studies, previous documents, published articles, institutional documents, and legislation, as well as findings on forest management approaches, trends in forest coverage, causes of forest degradation, and the PFM approach in Ethiopia. The framework of driving force, pressure, state, impact, and response was used to evaluate the country's forest resources. The forest policy before 1991 was a top-down management approach, which discouraged local people from having access to and benefiting from the forest resource and participating in forest conservation practices. During the transition period from the military to the federal government in 1991, most of the natural forest cover of the country was affected and degraded by the local communities until the transitional government passed state regulatory laws. The deforestation rate kept going up during the political transition period from 1987 to 1991 due to agricultural land expansion, settlement, and investment pressures. As an option, PFM was introduced in Ethiopia in the mid-1990s with the help of non-governmental organizations (NGOs). However, the new approach was not equally beneficial to the local people, like training, collecting non-timber forest products (wild coffee and spices), hanging traditional beehives in the forest, and providing firewood and round wood for home construction. The approach demands more finance, and it is run by NGOs. Therefore, the PFM's success depends on the financial return that the local people secure from the natural forests.

**Keywords:** forest management, Ethiopia, forest policy, forest status, deforestation

## 1. Introduction

Human history is linked to the use of diverse forest resources on earth [1]. Forests have been a source of food and fuel for cooking, shelter, and raw materials for buildings, transportation, construction, and communication [1]. Ethiopia has diverse forest and wood resources that include natural high forest, woodlands, bushlands, plantation forests, and on-farm trees. Forests have a great role in economic development in terms of gross domestic product (GDP); forests shared 5.7% of the total GDP in Ethiopia from 1995 to 2005, supporting rural poor livelihoods, earning foreign currency, providing energy sources, and providing environmental services [1–4]. Despite such benefits, forest resources around the world are declining due to deforestation, and in Ethiopia, from a 1,221,900 square km landmass [5], the forest covered 1.12 million square km [6].

In Ethiopia, deforestation has a long history that is associated with old settlements and agricultural practices [7, 8]. High deforestation has been practiced in Ethiopia since the beginning of the twentieth century in order to expand farming lands and human settlement areas. For example, in Ethiopia in the early twentieth century, averagely 40–35% of the total land was covered by forest, but by the early 1950s, it dropped to 16% and moved down from 3% in the 2000s [9–13]. Since the beginning of the twentieth century, deforestation has been practiced but has recently increased at an alarming rate, which was estimated at 15,000–20,000 ha per annum [14–16]. On the contrary, since 2000 onwards, some scholars have explained that forest cover in Ethiopia is increasing by 9% (0.3% of the total area of the country) due to sustainable land management practices in the country [9].

The drivers of land cover dynamics in Ethiopia are numerous and complex, and they vary from site to site over time [9]. The major reason behind forest degradation is human interference through activities like the expansion of agricultural land, grazing, firewood, and construction wood collection and poverty [10, 15] and the policies during the Dergue period (1974–1991) like

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collectivization, villagization, and resettlement [17]. Although there are many factors driving deforestation, agricultural expansion due to poorly defined land ownership and land-use rights is the main agent of declining forest cover in sub-Saharan Africa [18]. Similarly, in Ethiopia, the majority of the population lives in rural areas, and they depend on cultivation and agriculture as their main means of livelihood. As time passed, the population size increased, which demanded increases in crop cultivation in marginal areas and increased pressure on grazing, which in turn increased deforestation and soil erosion in Ethiopia [19]. Similarly, in Ethiopia, the majority of the population lives in rural areas, and they depend on cultivation and agriculture as their main means of livelihood. As time went on, the population size increased from 31.85 million in 1974 to 117.19 million in 2022 due to agricultural land encroachment and increased grazing pressure, which in turn increased deforestation and soil erosion in Ethiopia [19]. Based on the FOA's 2010 report, for instance, the high forest deforestation rate in Ethiopia was 2.3, 3.46, 7.63, and 4.6 thousand hectares in 2005, 2010, 2017, and 2020, respectively.

The conventional resource management approach, known as “fences and fines” and a centralized approach, prohibited local people from having access to forest resources and invited no participation from the villagers, which aggravated conflicts between the local community and management bodies in the tropics [17, 20]. However, it failed to protect the forest resources from human encroachment and illegal users. The overall effect of forest loss and degradation is leading to a decline in environmental goods and services like climate instability, loss of biodiversity, and reduction in human well-being [21], and this can be an underlying cause for declining agricultural productivity in Ethiopia. In addition, it also affects water quality, aggravates soil erosion, and causes drought, famine, and flooding. In sum, the effect leads to climate change and deteriorates the physical quality of the environment [22].

To combat deforestation, many countries have promoted and implemented community-based forest management (CBFM) to replace centralized forest management systems [23]. Particularly in the 1970s, decentralized forest management emerged in Southeast Asia, which was widely used to reduce tropical deforestation by ensuring tenure security and more responsible forest governance [24]. It is also becoming a popular trend in many developing countries to transfer natural resource management from a centralized approach to local government authorities through the decentralization process. This decentralized natural resource management approach had given local people a greater sense of ownership of the natural resources and made them more engaged in their implementation, monitoring, and enforcement [25]. As a result, the CBFM approach was viewed as an effective approach for forest resource protection, and many countries' experiences showed that forests under community management recorded a reduction in the rate of deforestation. The assumption is to increase democratization among local people in making the decision to control and use local resources. The system can also give benefits to local people in a fair and equitable manner [25]. The shift in forest management practices resulted in giving priority to forest resource sustainability through improved local people's participation, biodiversity conservation, and maintaining forest ecosystem services rather than improving forest yields [26]. For example, in Mexico, CBFM has a positive outcome for local people both by securing their income benefits from the resource and by maintaining forest resource cover and its associated ecological services [27].

Power decentralization in Ethiopia is mainly supported by the 1995 FDRE constitution under Article 50(4), which states that “state government shall be established at the state and other administrative levels that they find necessary. Adequate power shall be granted to the lowest units of government to enable the people to participate directly in the administration of such units” [28]. Therefore, the forest resources of the country started to be governed by the local people through the participatory forest management (PFM) approach, and this paper addresses the PFM approaches in Ethiopia. PFM is defined as the “exercise by local people of power or influence over decisions regarding the management of forests, including the rules of access and the disposition of products” [29]. In Ethiopia, it was started in the mid-1990s [24, 30–33] with the help of non-governmental organizations (NGOs) mainly in Oromia and Southern Nations Nationalities and Peoples Regional states (SNNPRs) with the dual objectives of reducing natural resource degradation and its impact on local people's subsistence. These two regional states in Ethiopia constitute a large amount of natural and plantation forest in the country and are practicing PFM to control forests jointly with the local people. The local people, who live in and around the forest, are involved in the management system to sustain the forest resources and gain economic advantages [24]. They are sharing the management responsibilities of forest protection, from planning up to decision-making. These could help bring an economic advantage to the local communities and enhance the biodiversity and ecological integrity of the forests [34]. In Ethiopia, it is one of the current management regimes aimed at achieving sustainable forest development by balancing forest resource conservation and utilization rates [33].

This review work could help to explain the historical perspectives of deforestation, forestry laws, and forestry policy since 1991 and PFM's impacts on forest status in Ethiopia. Therefore, the objective was to review the historical perspectives of deforestation, forest law, and policy since 1991 and PFM's impacts on forest status in Ethiopia. To achieve that aim, the review addressed the following specific objectives: (i) to discuss the forest policy and conservation approaches and their drawbacks on the forest resources of the country and (ii) to evaluate the forest resources of the country using the driving force, pressure, state, impact, and response (DPSIR) framework.

## 2. Review Methods

The work was based on previous documents, published articles, and policy documents from Google Scholar and Science Direct for content analysis. The literature search covered literature published during and before 2020. A content analysis of the selected literature was done on the coverage and degradation rate of forest resources, forest policy, and proclamation in Ethiopia. It could also include management approaches used to improve forest status, challenges posing huge impacts on the resources, and expected and actual benefits of the PFM approach to the forest and local livelihoods.

The key words used in the search strings were “forest policy of Ethiopia OR participatory forest management AND Ethiopia OR forest policy AND proclamation OR PFM AND impacts on forest OR deforestation rate AND Ethiopia.” The inclusion and exclusion criteria used to select articles for this review were: (i) articles of English-language literature and (ii) literature published in peer-reviewed scientific journals and institutional documents up to 2020. Here, the number of published papers found in peer-

**Table 1**  
**Estimates of total forest, woodland, and plantation cover in 2000–2020**

Forest type	Year							
	2000		2005		2010		2020	
	Area (ha)	Total land (%)	Area (ha)	Total land (%)	Area (ha)	Total land (%)	Area (ha)	Total land (%)
High forest	3,651,935	3.2%	3,337,988	2.9%	12,296,000	11.2	17,068.50	1.8%
High woodland	10,049,079	8.8%	9,632,616	8.4%				
Low woodland and shrub land	46,297,529	40.4%	46,297,529	40.4%	44,650,000	41	22,394.30	
Plantation	509,422	0.4%	509,422	0.4%	511,000	0.4	–	
Other naturally regenerated forest	–	–	–	–	11,785,000	10.7	–	
<b>Total</b>	<b>60,507,965</b>	<b>52.8%</b>	<b>59,777,555</b>	<b>52.1%</b>	<b>57,457,000</b>	<b>63.3%</b>	<b>39,462.80</b>	<b>35.2%</b>

**Notes:** All other woodland and shrub land <5 m in height and with crown cover >20%.

Land is classified as “forest” spanning more than 0.5 ha with trees > 5 m high and a canopy cover of 5%–10%, or trees able to reach these thresholds in situ, or with a combined cover of shrubs, bushes, and trees above 10%.

reviewed journals was too small, and therefore, the search was extended to cover gray literature such as scientific reports, proceedings, and institutional documents. All the selected literature was examined to extract meaningful information to achieve the review objectives. In addition, related literature was added after reviewing the reference lists of the final literature through backward reference list checking.

### 3. Results and Discussion

#### 3.1. Forest resources and rate of degradation in Ethiopia

##### 3.1.1. Forest resources of the country

Ethiopia has diverse forest resource types that are associated with diverse climate, physiographic, altitude, and edaphic elements. The vegetation types in Ethiopia range from tropical rain forests in the southwest to desert scrubs in the east and northeast and parkland agroforestry on the central plateau [12, 26, 35]. Forests have great socioeconomic and ecological importance. The forest resources in Ethiopia supply wood products for energy and construction, some valuable non-timber items, and supplementary foods for local inhabitants. It can also serve as a regulator of soil erosion, improve water percolation into the underground, balance the water cycle, and enhance evaporation. Besides, wood, bark, leaves, fruits, and roots can be used by society for forage, medicine, food, home construction, and a lot more. Plants also help the earth by absorbing carbon dioxide and, in turn, releasing oxygen gas into the atmosphere. Forests can serve as an area of entertainment and a source of income for local people. In addition, vegetation and trees also reduce the cost of removing silt from dams. However, the forest cover of the country was deteriorating in quality and quantity due to anthropogenic factors, and currently, it is found in a limited part of the country that is inaccessible to society [12]. Based on the estimation of Eshetu [12], the forest cover declined from nearly 40% in 1900 to 16% in the 1950s, 8% in the 1960s, 4% in 1973, 3.2% in the 1980s, and even less than 3% in the 1990s. As a result of the severe deforestation process, the country lost 140,900 ha of forest per year between 1990 and 2010, which was estimated to be 2,818,000 ha, or 18.6%. However, as Table 1 [36–38] shows, after the Ethiopian Millennium in 2007,

reforestation campaigns improved the forest cover of the country to 11.2% in 2010 and 15.1% in 2020.

Defining the term forest is ambiguous and may include different vegetation types in the definition by various organizations. According to the forest proclamation of Ethiopia (No. 542/207), forest refers to high forests, woodlands, and bamboo forests. According to the definition of Food and Agriculture Organization of the United Nations [39], the term forest comprises natural high forests, woodlands, plantations, and bamboo forests. Based on this definition, Ethiopia has about 35.13 million hectares. Based on the World Bank’s fund Woody Biomass Inventory and Strategic Planning Project (WBISPP) [38], the woody vegetation cover was above 52% of the land size of Ethiopia. If one refers to the definition of the Intergovernmental Panel on Climate Change that includes shrub lands based on the definition used by FAO, the total area covered by forest can be greater than 50% of the country’s land mass. From the two definitions, a slight variation in total forest cover was observed in Ethiopia. The variation in forest data emanates from the absence of regular inventory at the national level, the variation in the definition of forest, and the error in the interpretation of Landsat images.

Although forest resources have socioeconomic and ecological values, they are degraded and deforested at a high level by human interference, which includes population growth, poverty, lack of land tenure and property rights, a lack of land and forest policy, and sociopolitical instability. The rate of deforestation in the high forest was higher due to population pressures like farmland expansion and investment programs. The sector, in general, is affected by the absence of a good governing policy and its enforcement [40]. Table 2 below also depicts that high forest declined largely from 270,897 ha in 1994 to 48,235 ha in 1999, and during this 5-year range, about 262,662 ha of forest was deforested. Nevertheless, since 2000, the high forest types have declined in deforestation rate. On the other hand, woodlands and shrub lands did not decline at large, and woodlands improved from 1994 until 2003, but shrub lands after 2000 slowly declined.

##### 3.1.2. Trends in forest degradation

The trend of deforestation was high up until the year 1994/95. Later on, the formulation of national forest policies in 1994 and 2007 helped to control illegal forest users and reduce the degradation rate (Table 2). From the different forest types, the high natural forest was

**Table 2**  
**The rate of deforestation in Ethiopia by forest type (in hectares) from 1994 to 2010**

Types/Years	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2010
High forest	270,897	118,355	99,601	73,025	57,182	48,235	66,036	76,412	73,875	76,723	3,455
Wood land	83,720	77,929	75,460	79,195	83,379	85,365	86,611	91,038	95,633	96,323	–
Shrub land	44,678	51,432	56,752	59,377	77,242	70,164	68,051	65,548	61,854	58,685	–
<b>Total</b>	<b>399,295</b>	<b>247,716</b>	<b>231,813</b>	<b>211,597</b>	<b>217,803</b>	<b>203,764</b>	<b>220,698</b>	<b>232,998</b>	<b>231,362</b>	<b>231,731</b>	<b>20,200</b>

mainly influenced by the deforestation process during the political transition period from the *Dergue* regime to the Federal Democratic Republic of Ethiopia [12].

Figure 1 [14] indicates the rate of deforestation in areas of high natural forest coverage in Ethiopia. In the 1970s, forest coverage was 6.08% but declined to 3.96% from 1980 to 1990 and 2.36% after the 1990s. This gradual decline in deforestation in Ethiopia was the result of the previous national policy. Instantaneously, with the transformation of land governance, forest resources were put under state control. The state announced that the forest resources were the property of the state and that the administrative role of conserving and utilizing them was reserved for the central government. The government expanded the size of forest areas using forces, in which thousands of hectares from individual farmlands and communal pastures were converted into forest areas. The government applied systematic forces for mass mobilization and labor movements to rehabilitate degraded lands by planting trees and closing areas [7, 41]. After the downfall of the *Dergue* regime, FDRE started to react using forest policy and programs. These were the formation of the forest policy (proclamation no. 94/1994), the Ethiopian Forestry Action Program (EFAP), revising the 1994 forest policy in 2007, the creation of an opportunity for national and international organizations to engage in forest conservation and management work under the PFM approach, and the formation of the MEFCC [42].

### 3.2. Forestry policy and law after the 1991

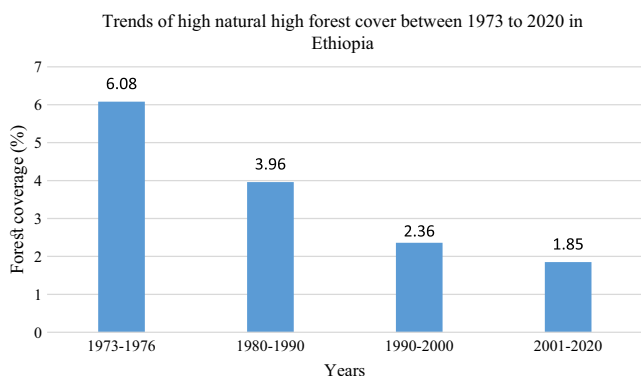
After the downfall of the *Dergue* regime, the local people used the politically unstable period to extract a lot of forest cover from the country. During this politically unstable time, the local community expressed their “revenge” on forests and other natural resources. This proved the absence of local people’s involvement in the

conservation and management of forest resources. The policy alienated the people from the forest and demotivated them to plant trees and conserve forests [17, 43]. During the transition period, the local people aggressively exploited natural resources because the transition government was unable to stop the illegal forest resource extraction. The 1995 constitution of FDRE declared that land, forests, and other natural resources are the property of nations, nationalities, and people of Ethiopia and the state. Though the constitution is like this, there is no clear way for the local people to manage the resources, and it fails to state who will govern them. In addition, all-natural resources are not open to people to sell, exchange, or use in the way they wish. In an actual sense, there are no people with full rights over the natural resources. This circumstance pushes the farmers to encroach on forest lands to convert them into farmland and pasture lands. Their intention is that once the forest is cleared and replaced with farming lands, they will have the easy-to-request user right. Later, when the central government detected the existence of a high deforestation rate throughout the country, they designed a strategic plan and a forest law to bring sustainability to both development and resource conservation. As a result, the central government established various policies like the Ethiopian Forestry Action Plan, a national action plan to combat deforestation, a forest policy in 1997 and 2007, and a conservation strategy in the 1990s, and Ethiopia made about 15 multilateral agreements on environmental issues at the international level.

Proclamation no. 94/1994 classified the forests into three types: state forests, regional forests, and private forests. The proclamation gave the responsibility to the private sector to involve itself in wood processing, and it also declares that the forest user should get the first written form of permission unless they will be punished by being put in jail and fined. This policy was functional until 2007. In 2002, the Environmental Impact Assessment was declared proclamation no. 29/2002. The proclamation focuses on a sustainable way of using forest resources. It supports forest product provision without negative effects on the environment or social values. It also bans free grazing in protected areas. Forest proclamation no. 542/2007 declared that the forests of the country are managed by either private or state-owned companies [44].

The existence of pressure from donor countries and an international institution like the International Monetary Fund and World Bank in the sector improved the involvement of non-state actors in forest governance. The sector falls under multilevel governance, and the regional state is empowered to administer lands and forest resources and to formulate laws and principles that can bring sustainable development. Under multilevel initiatives, the number and level of non-state actors like CBNRM and NGOs increased in number and level of participation from implementing conventional policy advances to advocacy, policy evaluation, and monitoring activities [45]. This initiated the development of PFM across the world and became operational in state-owned forests in Ethiopia in the early and mid-1990s in *Chilimo* and *Bonga* forests [3, 7, 15, 46].

**Figure 1**  
**Natural high forest coverage as a percent of the total landmass of Ethiopia**



### 3.3. Forest resource status assessment using the DPSIR framework

The DPSIR model is applied to identify and evaluate environmental problems and to state their causes, consequences, responses, trends, and relationships among the components [47]. The existence of socioeconomic pressure on resources resulted in changes in their state, like their diversity and availability, which had impacts on human beings and the ecosystem, necessitating a response to them.

**Drivers (D):** Our forest resources have driving forces, and the most common ones that are degraded and deforested are wood collection for fuel and home construction, illegal logging of commercial timber trees, failure of forestry laws and environmental policy, rapid population growth, rural poverty, agricultural expansion, and overgrazing.

**Pressure (P):** The pressures on forest resources are rural settlement and villagization programs. In Ethiopia during the *Dergue* period and FDRE, there was a resettlement program from the degraded northern part to southern and southwest Ethiopia. The new settlers cleared forests for settlement areas and farming lands. There is pressure from selective cutting for timber production. The illegal users cleared species that have high demand in local markets for lumber. Part of the Belete-Gera Forest area was influenced by the deliberate clearing of tree species that have no relevance for coffee shade. These acts created impacts in the forest by reducing species diversity and causing forest degradation and deforestation. In 1991, during the downfall of the *Dergue* period, deforestation was high. This was due to the centralized policy that the military junta implemented. The previous forestry policy isolated the local people from resource use rights and created a lack of ownership. These acts reduced the forest cover and species diversity of the forests. There was also a series of forest destructions during the political vacuum period.

**State (S):** Trends of deforestation and degradation of forests have a long history. The forest cover declined from 40% in the 1900s to 16% in the 1950s and later to 2.7% in the 1990s. This rapid reduction was accelerated by human factors, which are a direct and indirect approach to resources. Although the cover has improved since 2005 and has reached 15% currently, it is argumentative. This improvement is still not convincing the majority of scholars in the area. The variation is caused by a change in the meaning of forest from institution to institution. Thus, the trend of deforestation and degradation is still high, and the resource is declining both in quality and coverage.

**Impacts (I):** The existence of deforestation and degradation of forest resources has resulted in an impact on society and the ecosystem. The forest as part of the ecosystem faced challenges like the decline in its species diversity, abundance, and evenness. These created challenges to the functions and services obtained from forest resources. Most of the local people and lower classes in urban areas get their energy sources and heating from fuelwood and charcoal. High deforestation and degradation resulted in impacts on its supply. The users are forced to pay more for fuelwood and charcoal from their income. Particularly, the rural poor, whose main livelihood is directly related to forest resources, are more vulnerable to poverty. Women and children in rural areas are forced to travel long distances to get firewood, which impacts their lives and causes them to drop out of school. The implementation of PFM in forest management in some communities favored the rich and leaders of the forest user group (FUG) association at the expense of the needy and poor.

**Responses (R):** International organizations, the federal government, and regional-level governments reacted to combat degradation and deforestation in Ethiopia by designing policies, laws, and strategies. The national government enacted Forest Proclamations Nos. 94/1994 and 524/2007, the establishment of EPA, the EFAP, the introduction of environmental policy and laws, the adoption of MDG Goal 7, the signing of many international agreements, the establishment of a ministry of environment, forest, and climate change, the preparation of the REED+ protocol, and carbon finance. There was also the establishment of two biosphere reserves in SNNPRs, allowing international and individual actors to participate in the forest resource management system. International NGOs like Farm-Africa, SOS Sahel, Japan International Cooperation Agency (JICA), and GTZ are actively working to introduce PFM in Ethiopia and to push further to include it in the national forestry policy. The other type of response from the national government is the implementation of area closures, restoration of degraded areas, and soil water conservation programs. All these policies, laws, strategies, and agreements are happening in response to forest degradation and deforestation in Ethiopia.

### 3.4. PFM in Ethiopia

#### 3.4.1. Historical trends of PFM in Ethiopia

Many scholars [24, 30–33] stated that PFM was first introduced in Ethiopia in the mid-1990s with the help of both local and international NGOs. The first two NGOs are SOS Sahel/Farm Africa and the German development agency *Deutsche Gesellschaft für Technische Zusammenarbeit* (GIZ) (formally called GTZ). These NGOs help Oromia and the SNNPRs of Ethiopia implement the approaches. These two regional states of the country constitute most of the natural and plantation forests in the country, and they are preferred by NGOs to practice PFM [48]. In 1995, *Chilimo* and *Bonga* forests were selected from Oromia and SNNPR regional states, respectively. Following these two organizations, several other NGOs, like the Ethio-Wetlands and Natural Resources Association and the JICA, started to practice the PFM approach in pilot forest sites in Ethiopia. For instance, “GIZ is integrating PFM into the government’s Sustainable Land Management Program (SLMP) through a program called PFM-Sustainable Land Management (SLM), working in forests in and adjacent to watersheds in three regional states” [31]. In 2003, JICA established PFM associations in the *Belete-Gera* Forest in the Jimma zone, Oromia regional state. In both forest sites, local communities engaged in forest management to conserve the forests as well as share their benefits [24, 49]. The PFM approach expanded, and about 667,498 ha of forests are under 556 FUGs, which is about 40% of the country’s forest cover [24].

#### 3.4.2. Partners and legal grounds of PFM in Ethiopia: Between local communities and government bodies

PFM is a kind of partnership between government bodies and local communities. These two bodies have clearly defined roles and activities related to forest resources. Communities have a management role to enhance the sustainability of the forests. Without affecting the potential and health of the forest, the local people are allowed to get different benefits from the forest, like harvesting forest products, sharing revenue from the final products, and collecting payments due to punishment. The forestry sector has the mandate to deliver technical and administrative capacity to the local community. The support helps the local people manage the resources in a sustainable way. However, the international non-governmental organizations

(INGOs) at the initial step have the responsibility of facilitating and introducing new ideas, technologies, systems, and knowledge via training to build the capacity of both local people and government bodies [33, 50].

The community should have decision-making authority about their forest protection, utilization, rehabilitation mechanisms, and access. PFM has two objectives: environmental and economic sustainability. These dual objectives are achieved when the PFM bases its principles on national forest policy and laws. PFM is widely implemented in Ethiopia. The practice is supported by both national and regional forest laws and policies. The 1995 Ethiopian constitution allowed people to engage in any development that runs at the local level and stated the right of all peoples to be involved in policy formulation [46]. In addition, federal-level and regional forestry bureaus, particularly in Oromia, Amhara, and SNNPRs, have forest policy declarations that allow local participation. At the federal level, the Environmental Protection Policy of 1997 and “forest policy and strategy issued in 2007 recognize both the right of participation in the management of forest resources and the benefit sharing of local communities, which are key requirements for PFM implementation” [33, 50]. The two regional states of Ethiopia developed their own forest policies; for example, the cooperative establishment proclamation, and the Oromia regional forestry proclamation no. 72/2003 supports PFM initiation. All these provided legal ground for the operation of PFM practice in Ethiopia, and both the federal and regional bureaus of the forestry department prefer the approach as the best way to conserve and manage forest resources in the country.

#### 3.4.3. Characteristics of forest resources under PFM

This approach administers the resources of both natural and plantation forests. It can range from dry *Afromontane* forests to moist broad-leaved forests. The forest resources of the country before the introduction of PFM were influenced by serious

deforestation acts like farmland expansion and illegal timber production. Later, the PFM approach reduced such types of human impacts on the forest. The local people can collect products that are non-timber forest products (NTFPs), such as honey, spices, medicinal plants, dead wood, and grasses, and the effect is lower over the resource [12]. Table 3 [24, 49] below covers six forest sites where PFM was introduced. The number of households in relation to the forest areas in all sites is not uniform, and the value collected by the FUGs also varies slightly. The ratio of plantation forests to natural ones is small. According to Ameha [51], the forest status improved after PFM implementation.

### 3.5. PFM contribution for forest and socioeconomic sustainability in Ethiopia

#### 3.5.1. PFM impacts on livelihoods

PFM was introduced with the goal of bringing sustainability to local people’s livelihoods because forest resources contributed both cash and non-cash income sources. Many researchers have highlighted the positive effects of the approach on the local people’s living conditions. The forests are providing direct and indirect economic advantages to the local people. A study by Cremer-Schulte et al. [52] in Bale Adaba-Dodola supported the existence of livelihood improvements among the members of FUGs. This could be achieved by providing income and training for members on ways of diversifying their income sources outside of direct forest resource extraction. In addition, the price of fuelwood has increased since the implementation of the PFM because there is no free access to forest resources for non-member groups [51, 52]. A study by Takahashi and Todo [49] in Belet-Gera also showed the existence of positive impacts on local people’s livelihoods. On the contrary, the economic situation of local people who are not members is declining. The approach guaranteed members the right to live in and access the forests, but such rights were denied to non-forest user groups. These

**Table 3**  
Forest resources and pressure in the six PFM pilot sites

PFM site	PFM forest area (ha)		No. of households	Forest area per households	Overall forest condition	Valuable forest resources
	Natural forest	Plantation forest				
1. Adaba-Dodola	64,491 (83,000)	1,067	3,294	20	Intermediate	Timber, firewood, forest grazing, ecotourism
2. Chilimo	4,585	415	1,600	3	Intermediate	Timber, firewood, limited other NTFFPs
3. Mankubsa	16,798	17	6,875	2.5	Poor	Timber (limited), firewood, honey, forest grazing
4. Yabello	28,478	299.4	4,408	6.5	Poor	Timber (limited), firewood, honey, forest grazing
5. Bonga	34,381 (161,423)	214	8,961	4	Good	Timber (high potential), firewood, NTFFPs (high potential like honey, coffee, spices)
6. Belete-Gera	63,827	2,315	–	–	Good	Timber (high potential), firewood, NTFFPs (high potential like honey, coffee, spices)

**Notes:** According to Winberg [48], the total forest area in Belete-Gera under PFM was 170,000 ha, and the number of households involved was 15,000 in 2010. This differs from Takahashi and Todo’s [49] report in Table 3 above, which was less than 66,000 ha of land. This showed the absence of an exact data record in the current total forest area under PFM due to the failure of each concerned body to report their total forest coverage under the PFM system. The error occurred because there is no centralized office that records the size of forests transferred to the local communities and provides proper follow-up during and after the implementation of PFM. The data are found in disorganized ways in each of the NGOs working to establish PFM. The central government lacks the means to check the accuracy of the data, both on the number of local users and on the size of natural forests given to the local communities.

conditions created a hostile relationship and conflict between the two groups [52].

According to Winberg [48], PFM resulted in remarkable changes in communities living adjacent to forests. The majority of PFM actors depicted the existence of positive impacts on local people's livelihoods. The positive effect can range from the eradication of poverty to securing better living standards. This agrees with a study from Bonga by Gobeze et al. [3]. The livelihoods of the rural population in Bonga have shown improvement. This resulted in diversifying the income sources of the local forest users. The Farm-Africa project helps them to have income from beehives, poultry, wild coffee, spices, and the production of crops like potato, banana, and *enset*. The project is facilitating training about improving agricultural productivity and NTFPs. They were also assisted in having access to nearby microfinance. As a result, the asset level of the population increases, and their living standards also improve. After the implementation of PFM, the community is able to have assets like poultry, goats, equines, modern hives, traditional hives, and cattle [3].

According to Amente [53], the main livelihoods of local people in Adaba-Dodola were farming, livestock keeping, and forest resources. Before PFM was introduced to the site, they were extracting forest and allowing their cattle to graze freely inside the natural forest. This put the forest at a serious level of deforestation. But when PFM was introduced, it empowered the local people to utilize and regulate forest resources. The local people's extraction was limited to only dead wood collection and a limited amount of live cutting of very old trees. The approach resulted in positive impacts on the livelihoods of the member local people, and it gave them the legal right to access the forest to have products for farming equipment, home utilities, and firewood both for personal use and local market supply. Particularly, the poor member groups had a better advantage by selling allowable forest resources at higher prices. This idea is supported by Kubsa and Tadesse [54] in Bale Adaba-Dodola.

In addition, the local people secured an economic advantage from the ecotourism program. Ecotourism is an approach to sustainably using natural resources in tourist destinations. Tourists can be sources of income for local people by providing job types like tour guides, renting horses, retailing artifacts, and selling local foods, and the sector can broaden the range of job access for the local people. Bale Mountain in Ethiopia is known for its ecotourism activities, and many domestic and international tourists are flocking to the site. As a result, the local people need the forest to be conserved, and their levels are increased [53].

On top of individual benefits from ecotourism activities, it can secure a 20% financial gain for the local community from the overnight payments of tourists in mountain huts. The money is used for community development programs to "cover the running costs, maintenance, and construction of public primary schools in their village, which benefits the community at large" [55]. A similar result was recorded in Tanzania by Kajembe et al. [56], but in India, joint forest management has no sound impacts on the rural poor in the forest villages of *Betul* in Madhya Pradesh [57]. However, the level of impact is not uniform among all members of the FUGs. It might vary from place to place because all forest areas vary in their resource availability and access to members. For example, Mohammed and Inoue [32] reported the existence of variation between rich and poor sections of society. The leaders of forest user associations were relatively wealthy and influential groups in society. As a result, they used the opportunity to secure

more economic advantage, both from forest products and supplementary benefits like training and credit access from the initiator organization. The objective of the training and the subsidy was to improve the living conditions of the poorer parts of society in order to reduce their pressure on forest resources. But, in actual conditions, the poorer members had less incentive from forest resources and from the supplementary benefits of NGOs.

The impact differs from place to place and from forest patch to forest patch under the PFM system. This variation is associated with the way of utilizing the forests and other NTFPs. Some forests are rich in products like spices, wild coffee, and honey. A study by Mengist et al. [58] in Belete-Gera, Shebe-Sombo district, showed the existence of income variation obtained from the forest under the PFM approach. Particularly in the Belet forest site, the established association had two main groups: "WABuB" (local language implying forest users) with a coffee plant inside and with no coffee inside the forests. Those rural populations in forests with coffee inside have more coffee plants, and the production amount is also high per member. In addition, they produce different spices and honeybees in the forests. Compared to FUGs with no coffee inside the forests, their annual income is larger: 8499 ETB compared to 376 ETB for FUGs in the forest with no coffee inside their forest. The existence of income variation between the two forest blocks creates conflicts of interest, and members of the forest with no coffee have requested to plant coffee seedlings to increase their income advantage from the natural forests. However, their idea was rejected by the state forestry bureau.

### 3.5.2. PFM impacts on forest status: species diversity, abundance, and regeneration

Many researchers concluded that the rate of deforestation declined after the introduction of PFM in Ethiopia as the local people utilized the resources wisely. They are protecting their forest patches from illegal acts and applying silvicultural practices to improve the health of their forests. The member group allowed the use of only dead wood and limited live wood with permission from their association. The number of illegal users has declined, and people have reduced their grazing animal impacts on the site, which creates an opportunity for seedlings to grow in abundant numbers [53]. A similar result is recorded in India [59] and Tanzania [56]. In a study in Ethiopia at the Adaba-Dodola PFM forest site, regeneration of indigenous plant species was high and there were healthy seedlings. According to Gobeze et al. [3], forests under the PFM management system have shown better health than forests without the PFM system. The forest under the PFM approach has more species diversity, with a higher Shannon-Wiener diversity (H) index of 3.46 and a lower evenness (E) value of 0.61 compared to the forest with no PFM approach, with 3.367 H and 0.6586 E. The number of seedlings per hectare is also higher in forests under PFM. For instance, a study by Amente [53], stated that the forest under PFM had far better health conditions for seedlings than forests freely accessed by local inhabitants. Variation in forest health is detected within forests under the PFM system. Such variation happened due to differences in utilization by member groups. For instance, forests with coffee blocks had a high deforestation rate by removing the understory and ringing older trees that had less value for coffee shed trees. As a result, the species diversity was also low; based on the Shannon-Wiener index, it was 2.13 compared to 2.98 for the forest without coffee blocks [58].

The approach failed to show positive impacts on forest status from the very beginning. The main challenge to the forest

resource was during the first year and phase of association establishment, which was “last minute” logging. The intention was for the local people to use the opportunity to get benefits. Because once the association is established, they feel that having access to the resources might be difficult. This was created due to a lack of ownership by the community and an absence of belongingness to the forests. However, after 1 year of FUG’s establishment in Belete-Gera, the rate of illegal logging in the forest declined. Two reasons were mentioned for this: the first one is that local people’s understanding of the project and its regulations has improved. Second, the community is built on trust, and they obeyed the regulations, and members of the association cooperated well to achieve the objectives of the project. The study also stated that the forest cover increased by 1.5% after 2 years of PFM implementation. They justified CBFM as more successful than private management methods. The regeneration rate over open areas in the forest site also increased [49]. This idea is supported by Amente [53] in Bale, Adaba-Dodola forest site, because, during the first phase of the project’s lifetime, 1995–2006, the impact on forest cover was insignificant. After many discussions with the local inhabitants and concerned stakeholders, the PFM approach is created with the local name WAJIB (*Waldaa Jiraatotaa Bosonaa*), which is equal to the FUG [53, 60].

### 3.6. Challenges and limitations of PFM implementation in Ethiopia

Some of the notable challenges of the approach in Ethiopia extend from individuals living near the resource up to the central government. At the individual level, the main challenges were disbelief in the concept, disputes during forest boundary demarcation with individual farmers adjacent to the forest, and a lack of trust. More than these, some member groups misinterpret the concept and start “last-minute” logging of forests [49]. Lack of consistent and unwavering support from different levels of government offices contributed to the success of the approach. After PFM was implemented, the government failed to allocate budget and human resources to run the program. PFM is impaired by the existence of a policy that stands against conservation and sustainable utilization of resources. In some areas, a private investor is starting a business that stands against forest sustainability because they start a business by clearing state forests for commercial farming. The other main challenge is the weak reaction of the government organs to law enforcement on illegal encroachers and users; rather, the approach encouraged them to extract commercial timber from protected forest patches. The government also failed to conduct a forest status inventory as per the agreement [50].

The introduction of PFM resulted in negative effects on forest patches outside PFM and on non-member groups. Forests without PFM coverage are seriously deforested and degraded by the community, as they are freely accessed by them. The FUGs have the right to access forests for economic benefits, but non-member groups are excluded from such an advantage, and thus, they extract forest resources in illegal ways. This condition aggravated the conflict of interest between the two groups and created economic variation in communities [3, 51].

The cost of conservation outweighs the benefits for local people. The policy and legal rights restrict local people from securing sufficient income. Although the effective implementation of PFM maximizes both conservation and development agendas, the government reserved the right to allow the local people to

sustainably extract income from timber products. The government is giving training to the community that concentrates on the conservation part and ignores the economic side. As a result, the locals have no reason to incur a cost for conservation if the economic return is low [48].

### 3.7. The two opposing views on PFM

PFM in Ethiopia is now one way of managing the forest in collaboration between the state and the nearby local inhabitants. However, there are two opposing views about PFM outcomes among scholars, policymakers, and international donors and practitioners. The supporters claim that, as compared to the centralized approach, PFM does not see the people living in and adjacent to the forest as a threat to the sustainability of the forest but rather uses them as part of the solution. With this perspective, many researchers explained the improvement in forest regeneration and the decline in the deforestation rate. PFM thus leads sustainability in forest development in Ethiopia, and it is an effective forest management approach. The local people maintain their benefits from the forest, which helps to reduce the extent of poverty in the community, and the forest resources and its biodiversity are well conserved. It is effective by creating room for the participation of local people starting from planning up to implementation and decision-making concerning the forest resource [3, 33, 49].

As opposed to the positive outcome of PFM, there is a group of scholars who claim the negative effects of the approach on forest resources and institutional arrangements. Their critics say that PFM has not resulted in sustainability in forest resource development, no satisfactory improvement in the living standard of the local people who are involved in the FUGs, and weak institutional development since its inception. In addition, the approach is introduced, developed, and supported by NGOs, and the effectiveness of the approach is associated with the lifespan of the project at the forest site. When the NGO is withdrawn from the pilot forest site, the local people are unable to prolong the activities [32].

## 4. Conclusion

Historically, forest resources in Ethiopia have been in the hands of central governments through the Ministry of Agriculture. The system had excessive state governance that closed access to local people. The absence of local people’s contributions to the conservation and utilization of forests led the people to engage in illegal acts. The main causes of forest degradation and deforestation were the expansion of agricultural lands, settlement/villagization programs, illegal timber production, fuelwood and charcoal production, overgrazing, and others. The rate of forest degradation and deforestation was serious during the downfall of *Dergue* and in the transition period since the local people had less of a sense of ownership of the resources.

The PFM approach had positive results for the forest. Regarding forests, PFM helps increase the number of healthy seedlings and saplings in the forests. This was due to the reduction of illegal tree extraction, the avoidance of overgrazing, FUG members obeying the bylaws, and, in some sites, the FUGs applying silvicultural practices.

Although many scholars have come up with research findings that promote PFM as a viable option for forest resources and local people’s advantage, it is too early to celebrate this new paradigm.



This approach demands more financial capital to implement the strategy. Up until recently, it was supported by INGOs. It requires creating awareness among local people through training and education. Lack of training for local people resulted in more forest destruction. They need to use the opportunity to extract resources, and they interpret PFM as a way to secure full access to forests that were under federal or regional government protection before. The approach is practiced in remnants of high forest sites, but there is no motive to develop forest areas in degraded sites. It also results in shifting the deforestation process to forest areas that are not under the PFM system. In addition, the PFM practices in Ethiopia have huge challenges due to data gaps, both on the size of forests under the PFM users and the number of beneficiaries. Finally, in order to make the PFM approach more sustainable and have substantial impacts on the forest, governmental and non-governmental bodies should work to diversify the income sources of the local people and secure an equitable distribution of benefits among the members. In addition, the financial advantage of the local people could be secured by linking PFM user groups with REED-plus and carbon finance projects.

### Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

### Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

### Data Availability Statement

Data available on request from the corresponding author upon reasonable request.

### Author Contribution Statement

**Wondimagegn Mengist:** Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Supervision, project administration. **Asaye Asfaw:** Conceptualization, Formal analysis, Resources, Data curation, Writing – review & editing, Visualization.

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