

Research Article

Coffee Management Intensification Has Changed the Tradition of Coffee Forest Use in Southwest Ethiopia

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Received 22 November 2022; Revised 22 May 2023; Accepted 26 May 2023; Published 5 June 2023

Academic Editor: Anna Żróbek-Sokolnik

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The coffee production system has changed the notion of a forest common resources pool in southwest Ethiopia. It is weakening the customary right on forest through time. The objective of the study was to explore forest resources use in relation to coffee management intensity in southwest Ethiopia. The effect of coffee management intensification was narrated based on the nature of accessing forest resources, local control system, level of forest dependency, and nontimber forest products usage through time. Qualitative data were collected through an interview and walk-in-the-woods. It is worth mentioning that an age-old customary right is devolved, and a modified forest management arrangement is emerging along with the coffee production system. The result showed that coffee agroforest drives the use of forest resources in southwest Ethiopia. Coffee production is replacing the tradition of forest management for nontimber forest products. Collection of nontimber forest products is overwhelmed with coffee harvesting. Honey production area (i.e., *Luggoo*) has been changed to coffee plot. Only coffee owners hold the right to access coffee agroforest. Individual decisions are bypassing the social arrangement of forest resources usage. The nature and level of forest dependency have been changed along with the intensification of coffee management. In contrary to what most people believe, the study findings showed that better-off households are more forest dependent compared to poor households due to coffee production. The storyline depicts the need for taking into account coffee agroforest in sustainable forest management. The study suggests to revisit the notion of recognizing traditional forest resource usage brings sustainable forest management.

1. Introduction

Throughout tropical regions, traditional forest management practices are undergoing a change in response to economic development [1–3]. The specific social needs and economic and technological advancement have influenced the way how the local people use of and interpret their forest environment [4]. Likewise, the history holds true in southwest Ethiopia where the customary rights undergo changing through time [5–8], Stellmacher and Molling 2009. The *de facto* common pool forest resources usage has been gradually devolved to individual based forest resources use [6, 7].

The forest in southwest Ethiopia is increasingly modified into a coffee production system [5, 8, 9]. The tradition and cultural practices of forest management have been changed

along with coffee management intensification [2, 10–13]. Coffee management intensification has changed access to and local controlling system of forest resources [6, 7]. The notion of collecting dosage of nontimber forest products such as wild coffee, spice, and others through common property or open access system is limited as a result of the coffee production system [7, 14–16].

In the last three decades, there is a shift in the forest conservation approach towards participatory forest management which is a remarkable change in Ethiopia [17]. The approach has combined the conservation and development interest of forest to solve the conflict between the government and local people [17–20]. Participatory forest management has changed the forest controlling system over the three regimes in Ethiopia [21, 22].

With the emergency of community based forest conservation in 1980s, an interest has grown in traditional forest management practices across tropical regions [7, 15, 23–28]. Traditional forest management system has a distinct forest tenure arrangement that plays a major role in sustainable forest management [29–34].

Forest tenure rights are described as a legal or customary right that consists of a bundle of rights [30, 32, 33]. The bundle of rights consists of the right to access, use, manage, exclude, and alienate in using the forest [31–33]. In the literature, forest use right is stated as the right to collect timber and nontimber forest products either for subsistence or commercial purposes, and management is stated as the right to develop the forest to generate more benefits whereas exclusion implies the right to decide who can access and use the forest (i.e., preventing others from using and benefiting from the forest) and alienation implies the right to transfer including selling and leasing it [30, 33]. The property right comprises the rules that govern the local control system that dictates allowable and restricted actions in relation to forest resource use [31, 32, 35].

Participatory forest management has been introduced to Belete Gera in 2003 by NGOs to improve forest biodiversity management and local livelihoods [17]. According to Teketay et al. [8], participatory forest management empowers the local community to use and manage the forest resources sustainably. The local people in and around the forest organized as “forest user group” to manage and utilize the forest resources [19, 27]. Each member of the forest user group does have equal rights in accessing and using the forest resources [27]. Nevertheless, the forest has been progressively modified for coffee production which works against the notion of participatory forest management (Pers. obs.). Coffee plots are owned on an individual basis where the presence of coffee offers exclusive rights (*de facto* at the beginning and *de jure* gradually) in using forest resources [12, 13, 36, 37]. As a result, the common resource pool usage has changed to an individual based forest resource use (Stellmacher 2007).

Literature has shown that poor households are more forest dependent than better-off households [14, 38–41]. Scholars have argued that market-oriented forest resources use change the tradition of forest resources use [26, 28, 36, 38, 40, 42, 43]. Traditional forest resources management and the use and conservation of forest biodiversity in coffee agroforest are less studied in southwest Ethiopia. The objective of the study was to explore forest resources use in relation to coffee management intensity in southwest Ethiopia. In this paper, I argue coffee management has shifted the way how the local people shape and use the forest resources in southwest Ethiopia. This leads the nontimber forest products extraction from the natural environment to intensive coffee management [23, 44, 45]. At the same time, the common forest resource pool could be changed to individual-owned coffee agroforest. The long-lasting traditional forest management system devolved to an intensive coffee production system that put sustainable forest management under question mark [2, 11, 25, 44].

2. Methods of Data Collection and Analysis

The study was conducted at Belete Forest southwest Ethiopia in 2018 and 2019 (Figure 1). The total area of the Belete-Gera forest is 15000 ha [17]. The study area has undulating topography with a chain of mountains extending further east and west along the Jimma to Bonga main road. The altitude varies from 1000 m to 2900 m above sea level for the mountain tops [17]. Belete forest covers a chain of mountains that extend further northwest to the Gera district on the north side of the main road. The study area is also part of the upper catchment of the Gibe-Omo river basin system and many small streams that are tributaries to the big rivers such as Gibe and Gojeb rivers that rise in the area. The warm moist climate of southwest Ethiopia characterizes the climate of the study area. As the altitude varies from 1000 m to 2900 m above sea level, the study area is divided into *Qolla* (lowland), *Woyna dega* (mid-highland), and *Dega* (highland). However, the belt of coffee growing in the study area is known as *Woyna dega* (mid-highland) agroecology. The local people organized into forest user groups and signed an agreement with Oromia Forest and Wildlife Enterprises to be entitled in accessing and using forest resources. Forest resource use pattern of the local people changes with time. Currently, the tradition of forest resources use is dominated by coffee production.

The present study worked with five forest user groups, namely *Dabbiyee*, *Gurrattii*, *Qartamnee*, *Mexxii-Coffee*, and *Sokii* forest user groups. The forest has been under participatory forest management for the last two decades. The dominant ethnic group is the Oromo, most of whom are Muslim with a few Christians. The study area is one of the largest coffee-growing areas in the Jimma zone, southwest Ethiopia. Agriculture is the means of livelihood for most of the local people. However, the livelihoods of the local people and people-forest interaction are changing rapidly [46]. The forest users were entitled to usufruct rights. Forest use right was limited to nontimber forest products.

The local people were introduced to the aim of the study through the forest user group committee and field facilitator. Prior to undertaking the interview, the aim of the study was explained to each interviewee, and the discussion continued based on verbal consensus or agreement to take part in the interview process.

This study adopted an ethnoecological approach and guided by *praxis* of ethnoecology showing local people's practices in controlling and using forest resources. Discussions were undertaken to generate information on how local people control and use forest resources over time. It describes a particular setting of the pattern of forest resource use by forest users along with coffee management intensification. Forest users tell the story that makes sense of forest in their livelihoods [21, 47, 48]. The themes of the narration in the result section were outlined based on the storytelling forest user groups. The study employed mixed approaches including individual interview, key informant interview, and participant observation. Field notes were also taken to complement an individual interview and participant observation (walk-in-the-wood).

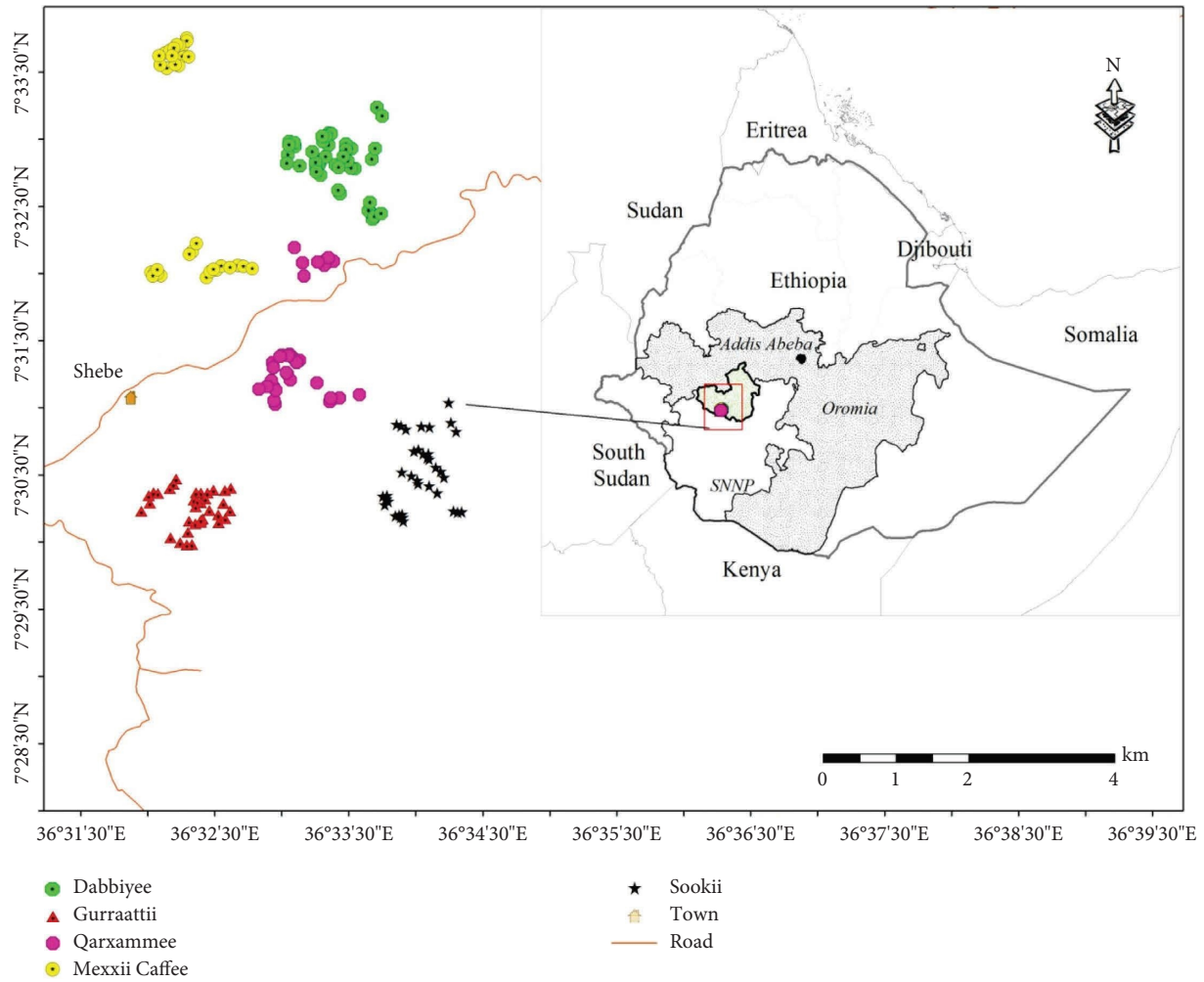


FIGURE 1: Map of Ethiopia with Oromia region, Jimma zone, location of study villages.

Nature and level of forest dependency were collected based on an individual self-reported. Nontimber forest products use and access to the forest were collected through individual interviews and key informant interviews.

Key informant interview was the tool employed to understand the tradition of forest management. Key informants were those who are knowledgeable about the land use history of the area. In the absence of documented sources (archives), oral history is used in ethnoecological studies to capture information with regard to historical events of people-forest interactions [49]. Listening to what people say may help to generate information about the experiences of forest users. Fifteen key informants were recruited with the help of the forest user group committee. The audio of 12 key informants was recorded, transcribed, and translated for the narrative analysis. Field notes were taken for 3 key informants and expanded for analysis.

To enhance the discussion, a topic of discussion (theme) was started using the following points but not limited to the land use history of the area, forest in the livelihoods of the local people, how local people control and access forest resources, etc.

NTFP users were stratified into honey and other NTFP users, i.e., wild coffee, spice, and participants were identified from the forest users with the help of the committee. Informants for NTFP users were those who actively collected or had an experience of collecting NTFP in their lifetime. A total of 128 forest users ($n = 65$ (NTFP), $n = 63$ (honey)) were interviewed. To enhance the discussion, a topic of discussion (theme) was started with but not limited to the experience of using nontimber forest products, changes that take place in the nontimber forest products collection area, how coffee management intensification affects NTFP use, etc. (Appendix). Table 1 shows the profile of the participants involved in the interview.

Purposive and snowball sampling techniques were used to select the informants for the interview. Both purposive and snowballing sampling techniques are nonprobability techniques. The first informant is purposively selected, and then, the interviewee suggests the next interviewee and so on.

Participant observation (walk-in-the-wood) was employed to confirm a change in access to nontimber forest products collection area and putting traditional beehive area

TABLE 1: Profile of participants involved in the interview.

Participants	Age	Sex	Debiye	Gurati	Kerteme	Meti-chafe	Sokii	Total
Key informant	45–80	Male	3	3	3	3	3	15
NTFP user	18–72	Male and female	23	13	18	11	0	65
Honey user	20–70	Male	10	16	9	7	21	63

due to coffee intensification and to investigate forest products use strategy collected during an interview.

The research for this project was submitted for ethics consideration under the reference LSC 18/233 in the Department of Life Sciences and was approved under the procedures of the University of Roehampton's Ethics Committee on 11.04.18.

3. Results and Discussion

3.1. Weakening but Still Survive "Mummee or Luggoo". This section narrates the effect of coffee management intensification on the local control system of forest resources over time. The local people accessed the forest through *Mummee or Luggoo*. *Mummee or Luggoo* has a meaning of territory controlled by local people, a system that can still serve as a norm to access forest products. The system enabled the local people to use forest products in general and honey in particular for generations. The system worked well before the Imperial (1960s–1974) period. During the Imperial (1960s–1974), Derg (1974–1991), and Federal Republic of Ethiopia (FDRE), although the forest belongs to the landlord and the government, respectively, the local people still well respected the tradition. After the introduction of participatory forest management in 2003, many changes were observed along with coffee production. With coffee management intensification, the local control system devolved into a coffee plot. Everybody had acquired coffee inside the forest and called it "this is my coffee plot." The result showed that coffee management intensification inside the forest had changed the local controlling system as well as accessing the forest resources. The informants substantiated a change in *Mummee or Luggoo* through time. An old man in his 60s narrated about *Mummee or Luggoo* as follows:

"The forest you see was known for different villages: *Baldaa, Dungee, Laaloo* etc. Those whose family dwell in the village had the right to access and use the forest. No one could access the forest beyond their *Mummee or Luggoo*. The tradition was well respected." (Key informant interview 2 September 2018).

Another interviewee narrated how the tradition (*Mummee or Luggoo*) started devolving with the emergence of coffee production. He recalls his memory and started talking about natural forest modification to coffee during the Imperial period [1960s]. He stated the introduction of coffee imposed restrictions on forest resources use. He thought for a while over the situation (natural forest modification to coffee) and stated as follows:

"We were imposed restrictive access to the forest during the Imperial period in 1960s. The landlord came and took away the forest. He [landlord] started modifying the forest to coffee. We became absentee landlord." (Key informant interview 2 September 2018)

Studies have shown the dynamic nature of accessing forest resources [6]. Wakjira and Gole [6] have documented the tradition of forest use "*Kobo*" in southwest Ethiopia. The tradition had been working until the emergency of coffee investors [6]. Ribot and Peluso [50] stated that access was similar to bundles of power to derive benefits, for instance, from the forest. Ribot and Peluso [50] indicated some forest users control access and others access through those who controlled the forest resources. Schlager and Ostrom (1992: 250) explained access as "the rights to enter a defined physical property." In southwest Ethiopia, accessing forest resources has undergone changes along with regime change [22, 51]. Zewdie [22] noted that denying access to forest resources encouraged forest degradation.

3.2. Forest Belongs to All Coffee Belongs to Me "Customary Right". This section deals with a change in customary rights due to coffee management intensification. The local people perceive that coffee management intensification had changed customary rights. Customary right is the right practiced by the local communities for using the forest resources. It is well respected among the local people although it has no legal recognition. Customary right was working during the Imperial (1960s–1974), Derg (1974–1991), and Federal Republic of Ethiopia (FDRE) period. The result showed that traditional forest management had been changed to coffee agroforest management. Forest modification to coffee agroforest dates back to the arrival of landlords in 1960s. A 72 years old man came to the area as a result of coffee cultivation by the landlord in 1960s. He said "I am originally from Addis Ababa. Mr. [---] had planted coffee and brought me as his coworker in 1962. I didn't see much coffee agroforest as of today. Coffee management intensification is a recent phenomenon." (Key informant 4 September 2018)

Coffee management intensification involved converting large areas of forest to coffee production as well as thinning bigger trees and removing under-growth nontimber forest products. Coffee management intensification had changed the nature of accessing forest resources. Coffee agroforest, a natural forest modified for coffee production, is entitled to individuals (i.e., customary right limited to only those who own coffee plots).

Schlager and Ostrom [52] have described four types of rights: access and withdrawal, management, exclusion, and alienation in resource use. Coffee management intensification had changed the rights to the coffee forest. Despite the forest being a common pool resource, the access and withdrawal, management, exclusion, and alienation rights go to the owner of the coffee agroforest. Previous forest users who formally organized to protect and use the forest were excluded from accessing the forest as a result of coffee plots inside the forest. The norm is well respected among forest users. During participant observation, I came across a young lady in her 20s years old collecting fuelwood from a forest coffee area. I talked to her about why she travelled such long distances to collect fuelwood. She said “It is not possible to collect fuelwood from somebody’s coffee plot. I must respect the norm.” (Interview 25 November 2018)

Individual and key informants had shown that coffee agroforest has changed the pattern of forest resources use. Individuals had the right to claim and restrict accessing the forest products once acquired coffee plots inside the forest. There is a feeling the forest belongs to all but coffee belongs to individuals. This notion goes to the economic and social value of the coffee. Many people talk about the place of coffee in their livelihood stating as follows:

“Our father advised us to have at least 0.25 ha of coffee plot. Coffee is a life insurance. It supports me when I get old. I can even inherit to my children.” (Key informant interview 1 September 2018).

A young boy in his early 20s years stated his perception of coffee as “Coffee is the source of income. I want to have coffee plot for my future life. I intensified coffee plot adjacent to my father. This time I have coffee plot and can cover my daily expense. I don’t ask for any money from my family” (Interview 19 September 2018). Another young boy in similar age stated as “My father has a small plot of coffee around home garden. Agricultural production is becoming low. I started to worry about my future life. I decided to have my own coffee plot inside coffee forest.” (Interview 25 September 2018). The result depicted that coffee production has a sense of individualism weakening the use of forest in common.

3.3. I Have Acquired Coffee Plot “Shame to Use Nontimber Forest Products”. This section narrates how lifestyle changes due to the income from coffee discourage the use of nontimber forest products. I talked to forest users who have rich experience in collecting nontimber forest products. The result showed that the local people collect nontimber forest products for subsistence as well as cash income. Many of the respondents stated that the forest was rich in nontimber forest product-bearing species. Table 2 shows the major nontimber forest products utilised in the area.

The storytelling depicts the importance of nontimber forest products in the past. An individual interview and key informant interviews had substantiated a change in the

TABLE 2: List of nontimber forest products and their sources as reported by individual users.

NTFP types	Local name (oromiffa)	Source (plant name used for the use)
Spice	Oogiyoo	<i>Aframomum corrorima</i>
Spice	Tunjoo	<i>Piper capense</i>
Seed	Buna	<i>Coffea arabica</i>
Seed	Ija sigilu	<i>Fagoropsis angolensis</i>
Bark	Qola baha	<i>Olea welwitschii</i>
Leaves and branches	Geeshoo	<i>Rhamnus prinoides</i>
Bark	Qola Anunuu	<i>Trichilia dregeana</i>

importance of nontimber forest products with coffee management intensification. The result showed that everybody had gone through the experience of collecting nontimber forest products from the forest.

Question: Do you collect [----]?

Answ. Yes, I used to collect [-----].

Nontimber collector in his early 20s years narrated the experience of collecting nontimber forest products as follows:

“We used to collect wild coffee and spice in the past. We acquired coffee plot and stopped the collection. At the moment non-timber collecting area is converted to coffee agroforest” (Interview 24 November 2018).

Similar story was narrated by a nontimber forest product collector. She stopped nontimber forest product collection due to forest modification to coffee production. She stated as “I used to collect *Geshoo* (*Rhamnus prinoides*) and other NTFPs in the past. Since the area is converted to coffee agroforest, I need to travel a long distance to get NTFP. Coffee management had removed NTFP-bearing species. I have decided to acquire my own coffee plot inside the forest and stopped the NTFP collection. I have planted spice and *Geshoo* in my homegarden” (Interview 30 November 2018). A 45-year-old man had experienced a similar experience. He stated “I collected NTFP for the last 30 years. I got a better income from it; meanwhile, the area was converted to coffee agroforest. I acquired my coffee plot inside the coffee forest soon and stopped NTFP collection.” (Interview 25 November 2018).

Lifestyle change and technological innovation were frequently mentioned reasons that have contributed to the change in nontimber forest product collection in the study area. For instance, technologically invented plastic has replaced mats and baskets (what they call *Yebboo*) made of phoenix leaves. Better off key informant forest users consider it shameful to visit the forest to collect phoenix leaves at the moment. A 45-year-old man stated “The poor sold phoenix leaves and buy food. It was shameful to be seen collecting phoenix leaves among us.” (Interview 25 November 2018)

Insights from individual interviews showed that the collection of nontimber forest products from the natural forest is becoming obsolete in four sites. I came across active nontimber forest product collectors only at one site. It was no longer common at four sites to regularly visit the forest to

collect nontimber forest products. The experience of nontimber forest products uses had changed to coffee agroforest experiences.

The informants told me that they experienced nontimber forest product collection in the early years and end up with the coffee plot. A young boy in his early 20s stated the situation as “Oh! I have acquired my coffee plots. I am not interested in nontimber forest products.” (Interview 24 November 2018). Another informant stated similar history as “I acquired my coffee plot six years ago. Before that, I used to collect *buna uumama* (wild coffee) and *oogiyoo* (spice). The area where I used to collect it has now become coffee agroforest. For one thing, it is not possible to enter somebody’s coffee plot. Secondly, *oogiyoo* is not good for coffee and I totally removed it from the coffee plot.” (Interview 28 November 2018).

Interestingly, the present study showed that culturally, it is considered shameful to engage in nontimber forest product collection once you own your coffee plots. I talked to a forest user who belongs to better-off wealth category. He stated “I have my own coffee plot. I don’t want to visit the forest for wild coffee and *oogiyoo* collection but I can pick along my trip. It is shameful in society to be seen collecting wild coffee and *oogiyoo*. If somebody sees me while collecting wild coffee and *oogiyoo*, they consider me as if I don’t have something to eat at home.” (Interview 24 November 2018).

Active *oogiyoo* (spice) and *buna uumama* (wild coffee) collectors travel long distances as the area where the collection took place in the past was converted to coffee plots. During participant observation, I visited four different areas where they used to collect wild coffee and *oogiyoo* in the past with five individuals, and I found that the areas were under coffee agroforest management at the moment. There were some observable remnant *oogiyoo* and wild coffee as indicators. My informant told me the area was full of wild coffee and *oogiyoo* before he owned it with coffee plots. He intensified the wild coffee and removed *oogiyoo* from his coffee. He said “anyone can come and use both the wild coffee and *oogiyoo* before I owned it. Now it is mine no one can enter my coffee plot. I removed *oogiyoo* as it is not good for coffee.” Field note 17 December 2019. During the key informant interview and individual interview, they talked about the sociocultural value of coffee implying the preferences were not only based on economic issues but also the sociocultural value that influence the choice of the two forest products.

Interesting emerging local practices along with coffee intensification were coffee sharecropping (locally known as *Yukuttoo*) and *Aggoo* (collection of leftover coffee from the ground freely).

First come and first serve was the local practice that govern forest management for nontimber forest product collection as the forest is a common pool of resources. In a coffee agroforest, the owner is entitled to decide regarding the use and management of forest resources. Some of the forest users were semimanaging *oogiyoo* in their coffee agroforest and a few planted it around their home. The findings of the present study showed forest management for

the diversity of nontimber forest products had shifted to coffee based forest management practices.

Nontimber forest products are a source of livelihood for millions of people [53, 54]. It means that the local people depend on the forest for nontimber forest products, and hence, allowing the local community to access the forest for nontimber forest products can motivate them to conserve the forest. Some studies have indicated the nontimber forest product potential of the forest in southwest Ethiopia [53]. However, Perez and Arnold [55] have noted that rapid global change, due to economic development, has influenced the local forest management practices for nontimber forest products. The notion of the right to use forest resources of the participatory forest management approach is associated with nontimber forest products. Lowore et al. [56] stated in their paper the possibility of solving forest conservation and forest based livelihoods improvement through nontimber forest products market integration.

Studies show that forest users across the world have a long history of dependence on the diversity of nontimber forest products collected from different land use types. Commonly collected nontimber forest products include fruits, seeds, barks, honey, spice, and leaves. The poor tend to be the ones who are involved more in nontimber forest product collection than others due to limited income sources [57, 58]. Forest coffee modification to coffee agroforest removed the practice of nontimber forest products. The present study finding showed a different arrangement of traditional forest management system in the study area than in other parts of southwest Ethiopia. As stated above in the study area, nontimber forest products are collected under an open-access system. The ongoing coffee intensification changed the open access system to *defacto* private property.

3.4. I Have Many Beehive Trees in the past “Right on Trees Vs. Right on Coffee Plot”. This section narrates the effect of coffee management intensification on honey production over time. Honey is one of the major nontimber forest products in southwest Ethiopia as the production is mainly associated with the forest. Next to coffee, honey is the most marketable forest product in the study area [59] [53, 56, 60, 61]. The local people have managed a diversity of flora for honey production. The tradition has positive contribution to forest biodiversity conservation in southwest Ethiopia. Bees prefer forest free from human disturbance, and the undisturbed forest is the best site for honey production.

Coffee management intensification had changed forest resources use for honey production. In the past, a few honey users had many beehives and beehive trees. The informants mentioned that the number of beehive trees as well as beehives was reducing at the moment. An informant stated “I have around 15 beehive trees. I put around 200 beehives in total. At the moment I have only 7 beehives trees. The number of beehives I put reduced by half. The yield also reduced by half.” (Interview 10 December 2018). In the past, roughly 17 kg per beehive could be harvested. At the moment, it needs roughly two to three beehives to harvest 17 kg of honey. Another informant narrated the reduction of the

total number of beehive trees as well as beehive numbers remembering the memory of the past. He started using the forest for honey production in 1960s. Unlike coffee which is common only around the home, he puts beehives mainly in the natural forest. Gradually, using the forest for honey production is becoming reduced. The area that was used for honey production area is now full of coffee with a few beehives hung up on trees.

“In the past it was honey not coffee [----]. Gradually things have been changed. Many *Luggoos* or *Mummees* (i.e. an area where beehives being put traditionally) were replaced by coffee plots” (Interview 10 December 2018).

Insights from individual interviews showed some of the honey users started using the forest for honey and then diversified coffee intensification.

“I started with honey 13 years ago and then coffee since 10 years. I wanted to increase my income.” (Interview 10 December 2018)

Others started with coffee and diversify with honey production.

“My father had coffee plot. I acquired coffee plot adjacent to him. For additional income I started honey. I learned the experience from the neighbour.” Interview 14 December 2018

Almost all forest users gave priority to coffee over honey. One of my informants said:

“Honey is possible only when you are of active age but coffee is life insurance. You can inherit coffee to your child. If you want you can sell your coffee plot. Our father advised us to have coffee plots.” (Interview 13 December 2018)

From a customary rights perspective, you can claim the whole area of your coffee plot but with honey, you can claim only on beehive trees. There were sharecropping system both for honey and coffee but honey requires skills in making beehives and climbing trees. Otherwise, the agreement is entered with skilled man share cropping what they call *Yukutoo*. The sharecropping experience in the study area is dividing half. This could be in kind or in cash. Sharecropping with coffee is easier. Anyone can enter into the agreement as coffee doesn't require special skills. They plant coffee and share coffee plot when coffee get mature or they collect coffee and share the yield or cash. As a result, forest users mostly opt for coffee rather than honey. Almost all forest users acquired coffee plots inside the forest whereas only a few forest users practice traditional forest beekeeping. In the past, only a few people were practicing honey production inside the forest but gradually more people became interested and began to undertake honey production inside the forest. Some of the honey users learned their experiences from the family others from the

surroundings. Unlike honey users, coffee users owned coffee plots by acquiring new land, inheriting from family, and purchasing.

“I have an area where I put beehive (i.e. *Luggoo* or *mummee*). I have three plots of coffee. I acquired one myself. I inherited another one. I bought the third plot.” (Interview 10 December 2018)

Since the last ten years, coffee intensification put the honey production area under pressure. The previous *Mummee* or *Luggoo* was modified to coffee agroforest. One of my informants narrated how he lost his *Mummee* or *Luggoo* as follows:

“I was not serious at the beginning when coffee started. I used my *Mummee* or *Luggoo* for some years. Then when the coffee got mature the owner of coffee started to complain his coffee is damaged. I don't have option as coffee shows tenure. I left the area and moved to another place.” (Interview 10 December 2018). Another informant told me how he modified his *Mummee* or *Luggoo* to coffee agroforest himself. He said “I saw people were losing their honey area I decided to modify to coffee agroforest not to lose my *Mummee* or *Luggoo*.” (Interview 14 December 2018)

An area under honey production for two to three generations was modified to a coffee agroforest. I visited the area with some of the traditional forest beekeepers. On the way, they told me about the land use history and who owns what. My field guider started to count his previous honey bee trees. The honey beehive tree was serving as coffee shade trees. He said “These were my honey beehive trees I lost the area due to coffee.” (Field note 17 December 2019). He acquired the coffee plot in another area and didn't worry as such. But others were frustrated and started to semi-domesticate bees around the home garden. Those who acquired coffee plots continued using beehives inside their coffee forest. Unlike honey, forest users exercise more customary rights with coffee. Since the forest belongs to the government, both of them are considered illegal, and hence, no one can bring the case to court. Any dispute was settled through elders what they call *Jarsumma*. The elders decide for the owner of coffee any time conflict arises between the users.

Tucker [4] has argued that the market is the driving force that encourages forest users to modify forests to cash crops. Forest users told me coffee has more markets compared to honey. Honey was sold mainly at the local market [53]. There were well-developed institutions and organizations that promote the coffee market. The dynamic nature of forest resource use tradition is related to the marketability of forest products. In the past, the price for coffee was low, and coffee was grown only for consumption. The current lucrative price for coffee encouraged forest users to move from homegarden to forest at large. Many informants mentioned forest modification to coffee carried out within the last few years along with market promotion for coffee through

government and nongovernment organizations. An informant told me that the current price of coffee is roughly 5 times four decades ago.

Anticipating successful forest management with livelihood improvement through honey production depends on forest resources arrangement. The current change in the tradition of forest beekeeping due to coffee intensification brings to attention the notion of forest conservation through honey production. The traditional forest beekeeping forest management approach gradually moved towards coffee based forest management approach. Coffee intensification disturbs the bee environment and reduces beehive forage and beehive materials. Informants noted the declining number of bee colonies. Only a few of the beehives attract bees inside coffee agroforest. Another important issue is about maximizing the benefits obtained from the forest. Many informants expressed their views that existing coffee intensification increased forest income but reduced the obtainable forest benefits. According to Wiersum and Endalamaw [53], coffee intensification is the traditional forest governance arrangement adaptation of forest in order to maximize the benefits of forest. Wiersum and Endalamaw [53] stated that the adapted forest coffee agroforest changes both the local norms and management intensity and rules regarding access to forest resources. The common property arrangement changed to private-based forest access.

4. Conclusion

The study explored the effect of coffee management intensification on the tradition of forest resource use. Traditional forest management approaches or local practices have been seen as vital for effective community based forest conservation. In this paper, accessing forest resources, the nature and level of forest dependence, and extractable forest products were narrated. I documented local narratives of forest resources pattern over a period of time and across three forest management regimes. The findings showed that the customary right to access and use forest resource has been subjected to change in the study area. The forest had been under different forms of forest use arrangement ranging from sourcing nontimber forest products to managed coffee. The common customary forest resources use *mummee* or *luggoo* have been undergoing change to coffee agroforest.

Currently, local people highly promote coffee agroforest to manage the natural forest in the sense that they assumed participatory forest management is meant to improve their livelihoods. There is a strong interest to maximize the economic benefit of coffee forest where coffee intensification is promoted resulting in coffee agroforest. The local people perceive the natural forest, coffee forest, and coffee agroforest differently. Along with coffee intensification, the common pool forest resource has shifted to individual based coffee agroforest. Coffee agroforest has given the local people exclusion and alienation rights with the notion of “forest belongs to all coffee belongs mine.” Collectively, connection to their

surrounding forest devolved into individual coffee agroforest users to the extent that collective action for common pool resources management progressively moved towards individual forest management system. The *defacto* traditional local institutions have been modified to an individual based forest resources use arrangement.

There is a change in forest use pattern and forest dependence due to coffee intensification. Although community based forest conservation recognizes registered forest user group members, some coffee plots were owned and managed by nonforest user group members. The long tradition of local people forest management practices is on the verge of coffee based forest management practices. With coffee agroforest the traditional norm, the rules for accessing and using the forest resource are changing. The right to beehive trees has changed to the right to coffee plot. Coffee agroforest has changed the social arrangement of forest products utilization including nontimber forest products and traditional honey production system. In the coffee agroforest, local people promote controlled utilization of forest products. The poor are forest-dependent and attributed to nontimber forest products; however, coffee intensification has changed this belief in the study area. The study findings suggest that nontimber forest products based forest management must be seen in the context of existing forest resources usage.

Appendix

Checklist for semistructured interview for KIIs, NTFP, and honey users

Semistructured interview

ID No: _____

Sex: (Male/Female) _____

Age (years) _____

Key informant interview

- (i) Tell me the land use history of the area
- (ii) Tell the role forest in the livelihoods of the local people
- (iii) Tell how the local people control and access forest resources over time (Imperial, Derg and FDRE)
- (iv) Tell me the tradition of forest resources use before and after PFM
- (v) Tell me the reason for forest modification to coffee production in the area.

NTFP user interview

- (i) Do you collect NTFP? Yes/No
- (ii) Tell me your experience of NTFPs collection?
- (iii) What are the major NTFPs in the area?
- (vi) Tell me how coffee management intensification affects NTFPs collection in the area?

Honey user interview

- (i) Tell me your experience of honey production?
- (ii) Tell how many beehive trees and beehive you have in the past and at moment?
- (iii) Tell me the tradition of forest use for honey production?
- (iv) Tell me how coffee management intensification affects the tradition of forest use for honey production in the area?

Thank you so much for your time and patience.

Data Availability

Data are available from the author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

The authors wish to acknowledge the local guider and coffee agroforest owner who willingly give permission to undertake vegetation assessment on their coffee farm.

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