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Forest coffee certification in Ethiopia: Economic boon or ecological bane?

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Forest Coffee Certification in Ethiopia: Economic Boon or Ecological Bane?

Till Stellmacher, Ulrike Grote

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Abstract

The montane rainforests of Ethiopia are the worldwide origin of the *Coffea arabica* gene-pool. However, the forests witness high rates of depletion and deforestation leading to an irreversible loss of the forest ecosystem and biodiversity. Certification of forest coffee started in Ethiopia in 2002 with the aim to conserve the coffee forests and provide the peasants with a better livelihood. This paper evaluates the forest coffee production and the related human encroachment in the forests ecosystem in certified and non-certified cooperatives and explores the benefits of certification for the producers.

The findings of the paper base on interviews conducted with forest coffee producers in nine certified and non-certified coffee cooperatives in the Kaffa Zone and Bench-Maji Zone of South-western Ethiopia and other stakeholders concerned. Empirical data shows that farmers undertake considerable interventions in the forest ecosystem in order to increase their coffee yields, e.g. by removing the forests' undergrowth and cutting trees. This promotes the degradation of the forest ecosystem and biodiversity and occurs irrespective of certification. Simultaneously, the local producer prices tripled in the same period - following the world market trend. This price increase has been found to be the main incentive for producers to intensify their production. This opens a conceptual dilemma for certification: certification aims at paying higher producer prices, but higher prices encourage the farmers to intensify their production and therewith to contribute to the process of forest depletion and loss of biodiversity.

Empirical data also illustrate practical difficulties of certification. For the season concerned, some cooperatives did not pay significantly higher producer prices than non-certified cooperatives. Additionally, certification is not actively promoted nor understood by those who are certified. None of the interviewed member of certified cooperatives could give a reasonable answer to the question what certification actually is or means.

Keywords:

Certification, Coffee, Forest, Ethiopia

Acknowledgments

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1 Introduction

Coffee (*Coffea arabica*) has always been Ethiopia's most important cash crop. For 2007/8, exporters anticipate a total harvest of 370.000 tons that commands a 35% share of the total export revenue of the country (Atté 2007). In contrast to other coffee producing countries, however, Ethiopia is characterized by two distinct features, namely a) coffee production is dominated by small-holder subsistence farmers, while plantation production plays a minimal role only, and b) Ethiopia is the origin of the worldwide *Coffea arabica* gene-pool.

At present, the Ethiopian montane rainforests comprise naturally regenerating coffee populations as an understorey shrub under the coverage of the forest canopy. The local population living in or adjacent to the forests traditionally utilize the coffee for own consumption and as a cash crop. In total, it is estimated that 60-70% of the total Ethiopian coffee production is gained from forest and semi-forest production systems (Teketay 1999).

Forest coffee grows organically. Most peasants cannot afford pesticides, herbicides or other chemical inputs. Yields of forest coffee are generally much lower than from garden or plantation coffee systems. Deviations, however, are high. Forest coffee yields tend to have tremendous annual fluctuations due to pests, unfortunate weather conditions or plant recovery/regeneration.

However, parallel to a world-wide trend, the montane rainforests of Ethiopia including the last wild populations of *Coffea arabica* are threatened by rapid deforestation. Recent studies in the Southern Regional State (SNNPRS) show that the forest area shrunk from 281,000 ha in 1973 to 191,000 ha in 2005 in this region alone (Wakjira 2007). Forests are gradually depleted and destroyed due to increased extraction of timber and non-timber forest products (forest mining) and conversion into agricultural land and settlements. This development is alarming not only because of the direct environmental and socio-economic consequences such as land degradation and scarcity of timber and non-timber forest products but of the irreversible loss of the world-wide unique wild coffee gene pool, leading to high consequential costs also for international coffee breeding and production (Gatzweiler 2007, Gatzweiler et al. 2008, Stellmacher and Mollinga 2009, Stellmacher and Nolten 2010).

This paper presents scientific knowledge on the ground realities about certification in Ethiopia. It is structured as follows: After the general introduction, Chapter 2 provides a brief literature review on the concept of certification and its role in Ethiopia. Subsequently the conceptual framework, research questions and hypotheses of the paper are presented. Chapter 3 provides the empirical data and their descriptive analysis. Based on that, in Chapter 4, conclusions and further research needs are formulated.

2 Forest coffee certification: literature and conceptual framework

2.1 Certification: the idea to add value to a unique product

The certification of products and services has gained increasing popularity in the last decade. In the context of globalization and trade liberalization, it can be expected that this trend will also become more prevalent in the future (Jenkins et al. 2004). Reasons are especially the growing concern about environmental degradation, exploitation of employees and safety of food products. The attractiveness of certification or labeling schemes is derived from their market-based and voluntary approach to achieve environmental and/or social goals (Basu et al. 2003; Grote et al., 2007, Wissel et al., 2010).

Certification schemes tend to follow a comprehensive and multi-criteria life cycle approach which takes separately into account production and processing stages, and a variety of types of environmental aspects – resource and energy usage emissions, waste creation or nuisance. In addition, process attributes such as animal welfare, biotechnology, packaging, working conditions, and social welfare are increasingly being considered in certification schemes (Grote 2002). It is likely, that in the future also other ecosystem services will gain more importance in this regard.

In comparison to environmental certification or the so-called eco-labeling, social certification promotes working conditions that are consistent with internationally recognized minimum standards like ‘no child labor’, freedom of association, wage levels, working hours etc. They entice producers to impose self-restraints on the employment of children. Along the same lines, fair trade is suggested as an organized social movement to empower producers from developing countries and promoting sustainability. The movement advocates the payment of a fair price as well as the implementation of social and environmental standards.

Certification is an instrument to add value to a product, and it addresses a growing worldwide demand for healthier and more socially and environmentally-friendly products. It is based on the idea that consumers are motivated to pay price premia for products that meet certain precisely defined and assured standards (Ponte 2004). These price premia can help internalizing environmental costs of the product by supporting more sustainable production, processing and marketing. However, price premia can also promote incentives that lead to unwanted effects (Grote 2009).

Producers’ benefits of certification relate not only to price premia, but also to improved market access, longer-term supply contracts which may lead to stronger relationships between buyers and suppliers, or increased productivity in management. Costs refer to the initial costs of investing into organizational and technical infrastructure as well as knowledge and labor needed to meet certain requirements, but also to the recurrent costs of certification.

2.2 Literature review

Research about certification generally relates to asymmetric information and either focuses on the producer or the consumer markets or tries to analyze the whole value chain which links the producers with the consumers. At the producer side, the analysis of the price premium and the determinants of the adoption decision play a major role, whereas at the consumer side, this is the willingness of consumers to pay for a certified product and the determinants of the purchase choice decision. The value chain analysis focuses more on the distribution of profits, market power and the organization and governance relations. In addition, monitoring and traceability are issues of importance in research about certification.

There are a number of theoretical papers which reflect some of these aspects. Basu et al. (2003), for example, show with a North-South model that certification can induce green technology in developing countries. International trade and income gains can have environmentally-enhancing effects. However, monitoring and enforcement determine to a large extent the success of the certification scheme. Mattoo and Singh (1994), however, show that certification can lead in some case to perverse environmental effects, when resulting differentiation between certified and uncertified goods leads to increases in the sales of the latter.

In another paper, Basu et al. (2004) analyze the determinants of the adoption decision for the producer. They use a game theoretic framework to show that the adoption of certification depends on costs of compliance and production, the number of other competing countries with certification schemes and the respective price premium.

Ibanez and Laye (2008) build a model of vertical relationships where two supply chains are in competition, one selling certified wood products, and the other selling standard wood products. They show that certification is always profitable for the ecocertified retailer. However, if certification works as a catalyst for coordination among producers, the certified retailer can be at a disadvantage if the differentiation between certified and standard wood products is not clearly recognizable for the consumer. Interestingly, in this case, only the producers and the retailer of standard wood products benefit from the certification initiated by the certified retailer.

A private good like forest coffee can be bundled with a jointly produced public good (e.g., biodiversity protection) via a certification scheme. Ferraro et al. (2005) examine the dynamic efficiency of eco-friendly price premia in achieving ecosystem protection and rural welfare goals by contrasting the use of price premia to the use of payments that are tied directly to ecosystem protection. They demonstrate analytically and empirically that direct payments are likely to be more efficient as a conservation policy instrument. However, if direct payments are not feasible for social or political reasons, they show that the certification approach is likely to be more effective in achieving conservation and development objectives.

There are also a number of empirical studies which focus specifically on coffee and its certification. A few studies have considered the impact of Fair trade certification on natural ecosystems and reflected the complexities involved in achieving sustainable development. For example, Philpott et al. (2007) found that while Fair trade coffee brought economic benefits to farmers, it did not necessarily protect biodiversity. Oxfam worked with coffee producers to improve the productivity of their land, forest conservation and increasing vegetable cover while acknowledging a need for greater analysis and response to ensure progress in environmental regeneration (Villaseñor 2000). Research undertaken at the University of Liege (Belgium) evaluated the "Fair trade project" on bananas in Costa Rica and Ghana, and coffee in Tanzania and Nicaragua, and concluded that the impact of Fair trade is easily identifiable with respect to human capital (knowledge, know-how) or social capital (networks, relationships) but it has an ambiguous effect on physical environments (Poncelet 2005).

It is quite often found that the contribution of certification schemes is difficult to discern from other factors. For example, Bacon (2005) found in the Nicaraguan context that Fair trade and organic networks can provide security and increased income, but do not offset the many factors leading to a general decline in quality of life for the farmers. Two other studies have voiced similar concern that the conditions and prices given in Fair trade are similar to those in the conventional channels in Mexico (Parrilli 2000) and in Thailand (Tiyapongpattana 2001). However, a role for Fair trade was identified in providing services and market access for those micro and informal businesses that could not access local service providers.

Lewis (2005) analyzed the Mexican coffee sector focusing on the links among low coffee prices, migration, and certified coffee production and trade. The results show that although remittances from migrants help finance coffee production, increased migration drains human capital out of the region which again raises the opportunity cost of labor and hence local wages, thus raising the costs

of coffee production. The findings raise doubts about the sustainability of the Fair Trade-organic coffee model in the face of migration opportunities.

Wollni and Zeller (2007) use data from coffee farmers in Costa Rica and determine the factors which make farmers participate in a specialty coffee market. They find that significant price premia are received by certified farmers as opposed to their non-certified counterparts and that social capital, if captured in terms of participating in a cooperative, is highly significant for the decision to grow specialty coffee.

Empirical studies on the socio-economic impact of certification also exist for other agro-food sectors. Dörr (2009) analyzes the Brazilian fruit sector and the impact of different certification schemes on producers. She bases her research on a survey of 303 mango and grapes farmers in the Northeast of Brazil from 2006. The results indicate that certified mango and grapes farmers receive higher net revenues through a price premium than their conventional counterparts, with the exception of melon farmers who mainly benefit from certification by staying in the market. She also finds that the contractual arrangements in the fruit value chain play a role.

Empirical evidence on price premia has been also found for organic certified rice farmers in Thailand and organic certified bananas and muscovado sugar producers in the Philippines by Carambas (2005). However, her value chain analysis shows that the shares of the total profits received by the certified farmers in the value chain are smaller than those of their conventional counterparts. Thus, the distribution of market power in the marketing chains differs, with the labeled exporters partly having a 10 to 40 percent higher profit share.

2.3 Certification in the Ethiopian (forest) coffee sector

Certification of agricultural commodities in general and non-timber forest products (NTFPs) in particular is a relatively new phenomenon in Ethiopia. The certification of forest coffee started in 2002. Activities and structures have continuously evolved ever since, but are still at their infancy stage. In the first years, only one certifier in the whole country was accredited or registered by EEC (Europe), NOP (USA), and JAS (Japan) to issue concerning certificates.¹ This monopoly fell in 2006 with other certifiers having opened branches in Ethiopia. Some of them started to certify forest coffee for the German market.² Simultaneously, Ethiopia increasingly attracted attention of the international standard holders, and Rainforest Alliance, Forest Stewardship Council and Utz Certified increasingly became active in the country.³

Certification of coffee in general and forest coffee in particular can use different concepts and standards, or a combination of them. Each concept follows a different approach, developed by different stakeholders under different agendas and backgrounds. All concepts, however, set up standards and principles, defined with a set of criteria and indicators (classified in major must/minor must or minimum/progress requirements) that serve as parameter for verification. In the following, the certification standards that are actually or potentially most relevant for the certification of forest coffee in Ethiopia are briefly illustrated.

The Fair trade concept, is considered a strategy for poverty alleviation and sustainable development. It aims at improving producers' living and working conditions by setting up minimum prices and price premia as well as guaranteeing a set of social standards following internationally recognized conventions - particularly those of the International Labour Organization (ILO). Members of Fair trade are development, church, consumer protection or environmental organizations. Fair trade certification can only be granted to a group of smallholder producers organized in peasant organizations (cooperatives/associations) "which are able to contribute to the social and economic

¹ Interview with BCS Öko Garantie (Addis Ababa, 18/04/2007)

² Interview with Non-timber Forest Products Project (Mizan Teferi, 02/11/07)

³ Interview with Non-timber Forest Products Project (Mizan Teferi, 02/11/07)

development of their members and their communities and are democratically controlled by their members” (FLO 2003).

While the focus of the Fair trade approach is clearly on social and economic development, it also involves environmental concerns. The generic Fair trade standards for small farmers’ organisations state that “The reservation of areas for biodiversity and natural resource conservation is vital to ensuring the long-term health and equilibrium of natural ecosystems and good water quality. The impact of humans on 100% of a given land area eliminates the possibility of the native ecosystem’s natural balance continuing.” (FLO 2005). The certification process begins with a written application to FLO-CERT from the producer organisation. The organisation will then be physically inspected against Fairtrade standards by a certification inspector. If the application is accepted, the producers are issued with a certificate valid usually for one year. This certificate can be renewed following re-inspection (Slob and Oldenzel 2003; FLO 2009).

Utz Certified is an internationally acting private sector certification initiative specially focussing on coffee. It works together with major stakeholders from industry, government and civil society. Its vision is to achieve sustainable agricultural supply chains. This is mainly achieved by focusing on the implementation of a track and trace system. The Utz Certified Code includes requirements of the good agricultural and business practices, social criteria and environmental criteria. With respect to the latter, it is important to note in the context of forest coffee certification that deforestation of primary forests is prohibited, that native tree species are to be used as coffee shade trees, and that endangered species need to be protected, apart from requirements that no or hardly any agrochemicals are allowed to be used or the soil erosion is to be prevented (Utz Certified 2006).

There are also certification schemes which primarily focus on the sustainable use and conservation of forest ecosystems and their biodiversity. The Sustainable Agriculture Network (SAN) is a coalition of independent non-profit conservation organizations that promote the social and environmental sustainability of agricultural activities by developing standards. Rainforest Alliance holds the Standards & Policy Secretariat for SAN. Both, SAN and Rainforest Alliance are dedicated to protecting rainforest and other ecosystems and the people and wildlife that depend on them. Their sustainable agricultural standard states that “Natural ecosystems are integral components of the agricultural and rural countryside. Carbon capture, crops pollination, pest control, biodiversity and soil and water conservation are just some of the services provided by natural ecosystems on farms. Certified farms protect these natural ecosystems and conduct activities to restore degraded ecosystems...” (Rainforest Alliance 2009). Certified are farms, businesses or communities.

Another forest concerned certification concept is the Forest Stewardship Council (FSC). FSC is an independent, non-governmental, not for profit organization established to promote the responsible management of the world’s forests. The FSC Principles and Criteria describe how forests have to be managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. They include managerial aspects as well as environmental and social requirements like “prohibit conversion of forests or any other natural habitat” or “identification and appropriate management of areas that need special protection (e.g. cultural or sacred sites, habitat of endangered animals or plants)”. Independent third-party organizations are accredited to certify forest managers and forest product producers to FSC standards. According to the principles of FSC, certification can also be related to non-timber forest products (NTFPs) which are defined as biological resources other than timber that can be harvested from forests for subsistence and/or for trade. NTFPs may come from primary forests, secondary forests, or forest plantations and may be intensively managed, extensively managed or unmanaged (FSC 2009).

An organic label indicates that a product has been certified against specific organic standards. Organic agriculture is seen as a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into

account that regional conditions require locally adapted systems. This is accomplished by using, where possible, cultural, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system.

In addition, coffee can be labeled as “shade-grown” or “bird-friendly”. Along with the qualitative benefit of coffee growing under shade, a forest-like production system provides habitat for a great number of migratory and resident birds as well as for numerous other species of animals and plants. It is most likely the crop that supports the highest diversity of migratory birds, native flora and fauna (Greenberg et al. 1997). “Bird-friendly” coffees are coffees that are certified as 100% shade-grown and organic. In cooperation with an organic certification agency (CERES) in Germany, the Smithsonian Migratory Bird Center incorporated a certified shade and organic coffee from Ethiopia in February 2008⁴.

Particularly on coffee specialty markets, Geographic Indications (GIs) and trademarks are not less relevant than certification. Although they aim at the same economic rationales, such as to differentiate a product on a market, to protect against third party free-riding, to reduce consumer search costs, or to solve market failures due to asymmetric information, there are substantial differences in structure and definition, historical development and regulatory frameworks (MacDowell 2005).

In the context of coffee from Ethiopia, the question whether to use a trademark or GI for the protection of coffees from the regions of Harrar, Sidamo and Yirgacheffe caused a conflict between the Ethiopian government and the Starbucks Company that gained much media attention in 2007. This dispute is settled in the meanwhile, but discussions about which market instruments fit best to upgrade Ethiopian coffee continue to go on.

2.4 Adoption of certification in the Ethiopian forest coffee value chains

Until 2008, the bulk of Ethiopian coffee harvest was traded via a semi-liberalized and auction-centered marketing chain. In this system, small-scale producers sold their sun-dried coffee in small tranches to local merchants, the collectors, locally named *sebsabies*. In general, collectors attached relative little importance to quality standards or traceability of the coffee. Collectors resold the product to the wholesalers, the *akrabies*, who facilitated the follow-up processing (cleaning, stoning, de-hulling) and transported the beans to Addis Ababa where they were inspected by the state-run ‘Coffee and Tea Quality Control and Liquoring Unit’ at the national processing and liquoring centre. Coffee suitable for export was sent to the national coffee auction, where exporters with a corresponding license could bid on it. The exporters sold the coffee to international importers, who then sold it to roasters in the destination countries (Stellmacher 2008). A separation of forest coffee against other coffees was not foreseen in this market chain. Forest coffees from South-western Ethiopia were blended with semi-forest and garden coffee from the same regions and sold at the national auction under the classification Jimma 5⁵ (Petit 2007).

However, in 2008, the Ethiopian government implemented far-reaching reforms on the agrarian markets. Rendering redundant the 37 years-old centralized national auction system, ever since the wholesalers have to sell their coffee via the decentralized Ethiopian Commodities Exchange (ECEX). On ECEX, trading is done on the basis of standardized contracts, according to coffee origin, type and grade. This aims at preserving integrity of the origins and unique attributes of the coffees while maximizing the number of buyers and sellers in the price bidding, thus ensuring competitive and transparent price bidding. Although the largest growers and the cooperatives can be licensed to

⁴ http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/Coffee/Bird_Friendly/ethiopia_certification.cfm (accessed on 26/03/2009)

⁵ Jimma is the largest town in South-western Ethiopia. The number 5 stands for unwashed coffee.

bypass the ECEX and to sell directly to the exporters, all other Ethiopian coffees have to go through this exchange (FDRE 2008).

Parallel to the mass-product coffee marketing systems, an alternative coffee value chain - the so-called coop-union system – developed in Ethiopia in the last years and gained particular importance on international specialty coffee markets. The coop-union system is essentially based upon local Agricultural Service Cooperatives (ASC) established in the 1970s by the then military *derg* government. In 1990, with the *derg*'s reign coming to a close, all ASCs were formally dismantled and numerous cooperative offices and shops were looted and destroyed. Particularly in remote rural areas, though, the organizational and infrastructural skeleton of many cooperatives continued to exist, however, often in a status of bankruptcy (McCarthy 2001; Pankhurst 2002; Stellmacher 2007a; Stellmacher 2007b).

Since the 1990s, the new Ethiopian government facilitated the restructuring of coffee cooperatives and the formation of cooperative umbrella associations, the coffee cooperative unions. Since 2001 the unions were legally allowed to by-pass the coffee auction and directly negotiate with and sell to international exporters (GTZ 2006; Petit 2007). In 2007, six coffee unions are operative in Ethiopia. Out of them, two are specialized in forest coffee, namely the “Kaffa Forest Coffee Farmers Cooperative Union” (KFCFCU, in the following referred to Kaffa Union) and the “Bench Maji Forest Coffee Producers Farmers' Cooperative Union” (in the following Bench Maji Union). Both are geographically located in the forest coffee areas of South-western Ethiopia.

Both forest coffee unions engage in certification. In May 2007, a total number of 12 cooperatives were certified in both unions, according to Fairtrade, organic (EU standard) and Utz Certified standards respectively.

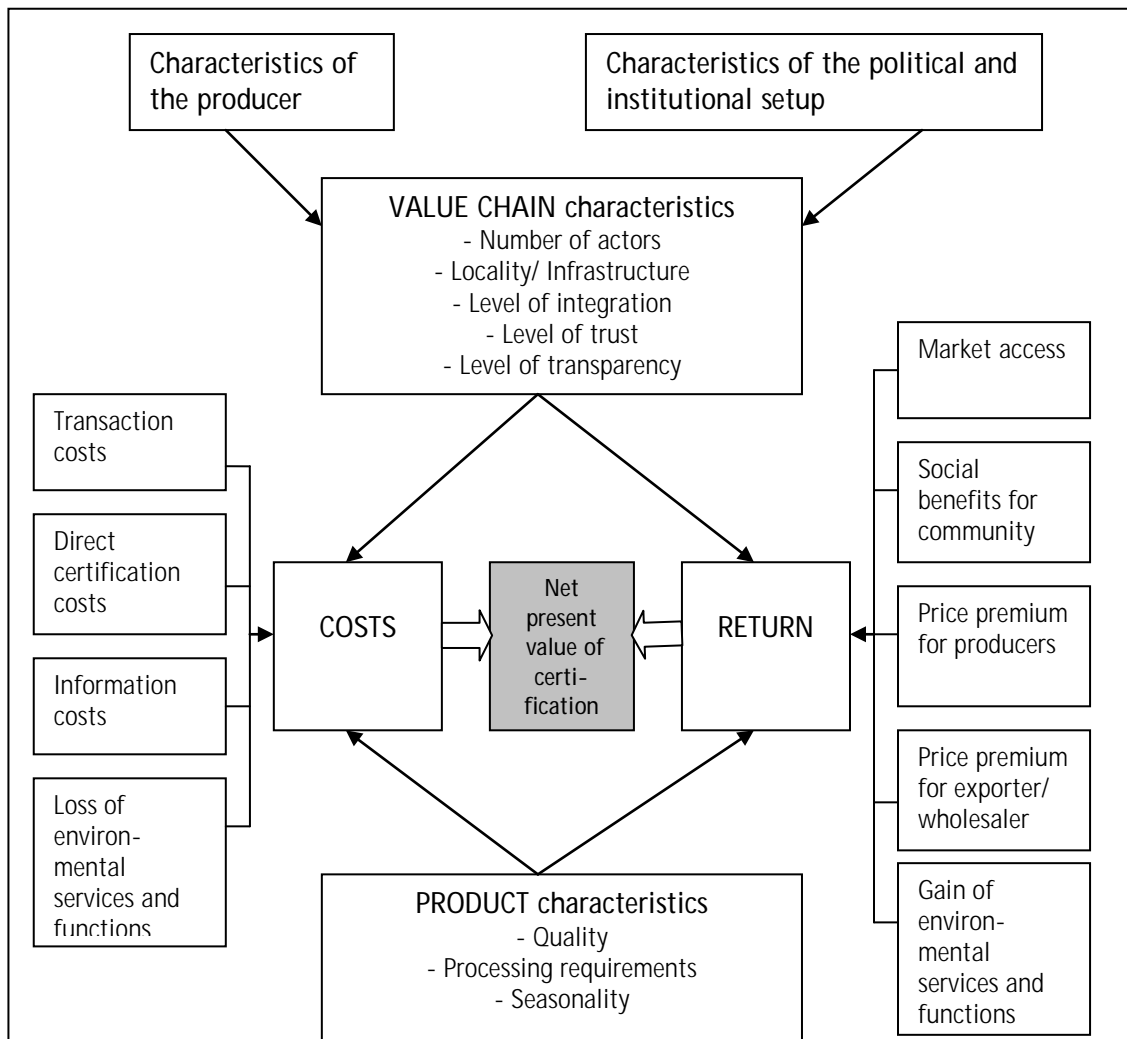
2.5 Research objectives and the conceptual framework

Based on the literature review and the description of the situation of certification of forest coffee in Ethiopia, a number of research questions arise. Thus, the study aims at answering the following questions:

- Are there differences between the forest coffee production and forest management in certified and non-certified cooperatives?
- To what extent do the forest coffee producers receive net benefits from certification?
- To what extent are forest coffee producers aware of and involved in certification?

In order to better understand the process related to certification adoption in the coffee sector in Ethiopia, this paper follows a conceptual framework of costs and benefits of certification as illustrated in Figure 1. It can be applied to the forest coffee producers and to the coffee cooperatives.

Figure 1: Conceptual framework of costs and benefits of certifications



Source: Own framework.

The adoption of certification depends on the costs and returns of individual actors in the value chain which again are influenced by different product characteristics like quality or seasonality. The returns of certified coffee can be of different types. Most generally, the price premia provided to producers and exporters play a major role. However, also the access to new markets may play a big role. Implementing a standard against which products are inspected and certified can also reduce transaction costs. Apart from these more actor- and interaction-specific returns, community benefits can accrue, relating to improved access to social services, e.g. health centers or schools. Certification, however, also induces additional costs, most evidently in the form of direct certification costs (e.g. for certification audits), but also as information costs. On the consumption side of the value chain, the willingness of a consumer to buy certified products depends on the trust he or she puts on the information he or she gets. This needs for proper information management and controlling. On the production side, producers need information and understanding on the goals, the process and the requirements of certification.

This paper investigates returns of certification on the local level. It refers to the main objectives of the forest coffee certification activities in Ethiopia, which are to conserve the coffee forests and simultaneously to provide the forest coffee producers with a better income. Accordingly, the paper focuses on two fields of returns, which are a) the gain of environmental services and functions, and b) the price premia for producers. Beyond, the coherences between these components are investigated.

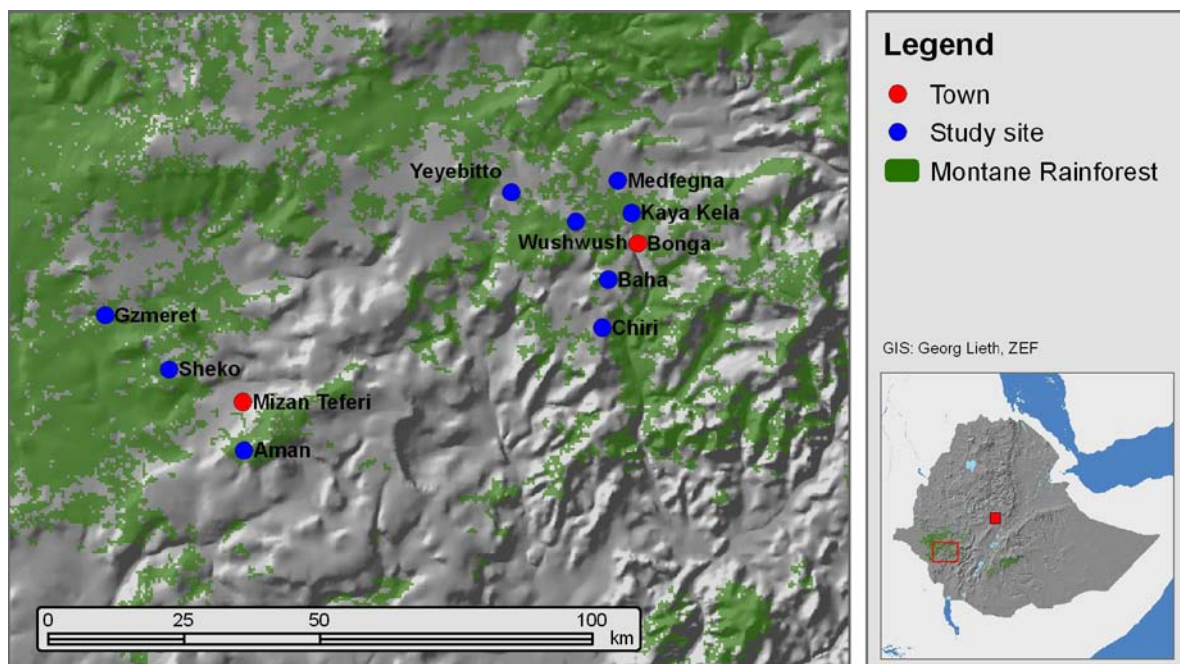
3 Data and results

3.1 Survey areas and data collection

The paper is based on empirical field research conducted in South-western Ethiopia in 2007/8 in the framework of the German-Ethiopian research project “Conservation and use of wild populations of *coffea arabica* in the montane rainforest of Ethiopia”.⁶ The undertaking was built up on research findings, experience and infrastructure gained by previous work in the same forest areas since 2002. A pre-test was conducted in April/May 2007 in nine coffee forest cooperatives, namely Gzmeret, Sheko and Aman under the Bench-Maji Union and Yeyebitto, Wushwush (Michiti), Medfegna, Kaya Kela, Baha and Chiri under the Kaffa Union. The main empirical research was undertaken in October/November 2007 in the cooperatives of Medfegna, Yeyebitto, Gzmeret, Chiri and Kaya Kela.

Semi-structured interviews were carried out with 61 local forest coffee farmers in certified and non-certified coffee cooperatives. Interview partners were selected by using cooperative membership records, balanced on gender and ethnicity. The questionnaire was structured on the topics: a) production of forest coffee, b) marketing of forest coffee (via cooperative and/or private merchants), and c) information and understanding of certification.

Figure 2: location of the study sites in South-western Ethiopia



Source: Georg Lieth, based on MODIS 2005 satellite image

Beyond the household surveys, expert interviews were conducted at different levels of the value chain and its institutional environment. In the forest areas, these were chairpersons and board members of the coffee cooperatives as well as representatives of Forest Coffee Cooperative Unions. In Addis Ababa, interviews were held with representatives of about 20 concerned agencies from civil society, state and business. Additional input was gained from two workshops on “Forest Coffee Certification and Marketing” organized at the Institute for Biodiversity Conservation (IBC) in Addis Ababa, Mai 2008, and ZEF in Bonn, September 2008, respectively. In these workshops, selected experts from coffee trade, certification, NGOs and research shared their understanding and assessment of the prospects and challenges of forest coffee certification in Ethiopia.

⁶ For more information see the project’s webpage under www.coffee.uni-bonn.de.

3.2 Results

The empirical data, as described in section 3.1, was analyzed descriptively. An econometric analysis was not conducted due to the small sample size. Nevertheless, some interesting results derive from the descriptive analysis. Especially those related to net benefits of certification are highlighted in the following.

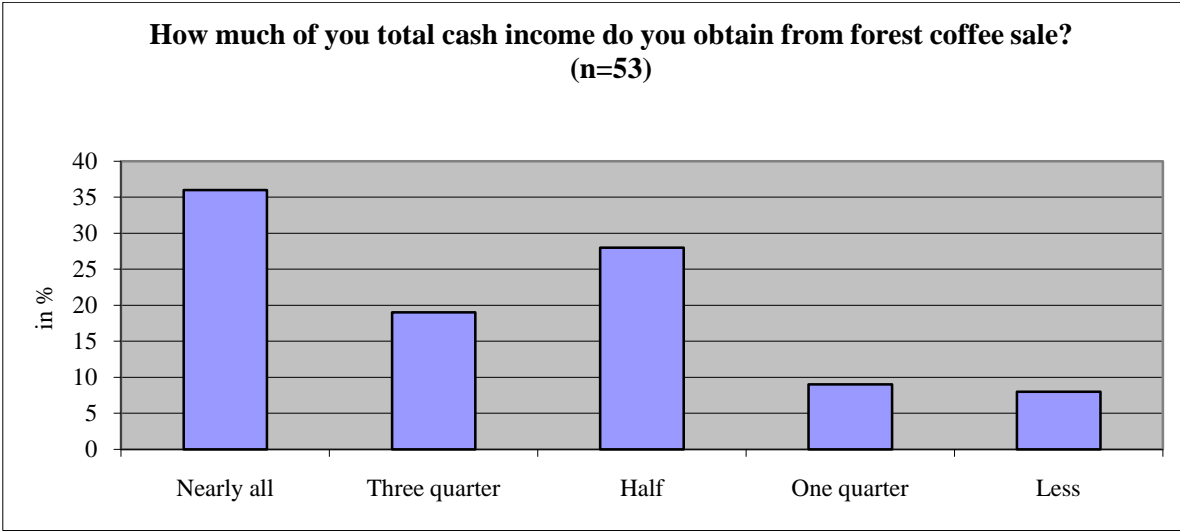
3.2.1 Characteristics of the forest coffee producers

The livelihood of local communities in the study areas traditionally stands on two pillars, namely household-based subsistence agriculture and the extensive use of forests. Peasants cultivate considerably small plots of agricultural land. In Yeyebitto cooperative (which is under the Kaffa Union), for example, households hold an average of 1 hectare of cropland – mainly for the cultivation of staple food such as maize and the root crop *enset* (Stellmacher 2007a).

Beyond agriculture, the local population utilizes a wide array of products from forestry, namely timber, firewood, coffee, fruits, honey, spices, herbs and fodder, among others. Industrial timber logging does not play a role.

Forest coffee is the main cash crop for many households living in and around the coffee forests (Wakjira 2007; Stellmacher 2007a). The relative importance of the income from forest coffee for the households in the investigated cooperatives is shown in Figure 3.

Figure 3: Importance of forest coffee as a cash crop



Source: Own survey.

Figure 3 shows the high dependence of the cooperative members on forest coffee. Around 75% of all interviewed households gain half or more of their cash income from selling forest coffee. Highest dependency was observed in Gzmeret⁷ cooperative, where all interviewed cooperative members stated that they obtain nearly all of their total cash income from forest coffee sale.

The data also shows that the educational level of the cooperative members is considerably low. Large proportions including the functionaries of the cooperatives are illiterate. 45% of the interviewed cooperative members did not go to school; more than the half of the school-goers dropped out of school before Grade 6 (n=56).

⁷ In the Gzmeret cooperative, the coffee collected by farmers is Utz Certified.

The ethnic and religious composition follows the country-wide heterogeneity given in Ethiopia. The interviewed cooperative members are dispersed among ten ethnicities. 55% belonged to the Kaffa people, 17% to the Amhara, 7% to Mandjah, 5% to Bench, 5% to Kambata, while 12% identified themselves belonging to other ethnic groups. 85% of the interviewed cooperative members are affiliated to the Ethiopian Orthodox Church, 10% are Muslims, and 5% Catholics.

3.2.2 Forest coffee production

The socio-economic and ecological circumstances under which a product is produced is important for the approach and success of its certification. The production of forest coffee is determined mainly by the products' natural attributes as an NTFP and the socio-economic background of its users, hence the smallholder subsistence farmer living in and adjacent to the coffee forests. The following table provides data on the background of forest coffee production in the studied cooperatives.

Table 1: characteristics of forest coffee production in different cooperatives

	Certified (Fairtrade + Organic) ⁸	Certified (Organic) ⁹	Certified (Utz Cert.) ¹⁰	Non- certified ¹¹	Average
Av. production per household (kg green coffee)	107	219	968	107	347 (n=60)
Av. size of forest per household	1.0	1.0	4.9	6.3	3.5 (n=57)
Av. yield (kg green coffee/ha)	110	230	182	20	104 (n=57)
Av. walking distance from homestead to forest (in min)	29	49	22	13	30 (n=55)
N	12	10	14	18	61

Source: Own survey.

Table 1 shows strong differences between certified and non-certified cooperatives (coop). In terms of production per household, the Utz Certified cooperative shows the figures (968 kg/green coffee), whereas the one that is certified Fairtrade and organic and the non-certified cooperatives show the lowest average production (107 kg/green coffee). The average forest size per household is 3.5 ha. However, differences between the coops are tremendous, with forest sizes being about six times larger in the non-certified coops than in the ones that are certified Fairtrade/organic and organic only. These differences are also reflected in the average yields. With 230 kg of green coffee per ha, the yields in the coop that is certified organic are more than 10 times higher than those in the non-certified ones. In conclusion it can be stated that the productivity of the forest coffee production system in the coops that are certified is higher than in the non-certified ones.

The average walking time from the homesteads to the coffee forest areas is half an hour, which is – by fast walking in a rough-terrain environment - around 3 km. The walking time is higher in the certified coops than in the non-certified ones. Geographical nearness between households and the forest areas can hence be excluded as a factor to explain the higher productivity in the certified cooperatives.

To evaluate the trend of forest coffee production in the cooperatives concerned, farmers were asked how much forest coffee they produced in the season 2006/7 compared to five years ago in 2001/2.

⁸ Medfegna Cooperative

⁹ Chiri Cooperative

¹⁰ Gzmeret Cooperative

¹¹ Yeyebitto Cooperative, Kaya Kela Cooperative

Table 2: change in forest coffee production between 2001/2 and 2006/7

	Certified FT + organic (Medfegna)		Certified organic (Chiri)		Utz Certified (Gzmeret)		Non-certified (Yeyebitto, Kaya Kela)		All cooperatives (incl. pre-test)	
More	7	58%	9	90%	7	70%	9	64%	35	69%
Same	1	8%	1	10%			1	7%	3	6%
Less	4	33%			3	30%	4	28%	13	25%
No data					4	-			4	
N	12	100%	10	100%	14	100%	14	100%	55	100%

Source: Own survey.

The table shows that there is a trend towards more production in all cooperatives, independent on whether being certified or not. More than two thirds of all interviewed cooperative members indicated that they produced more forest coffee in the season 2006/7 than in 2001/2.

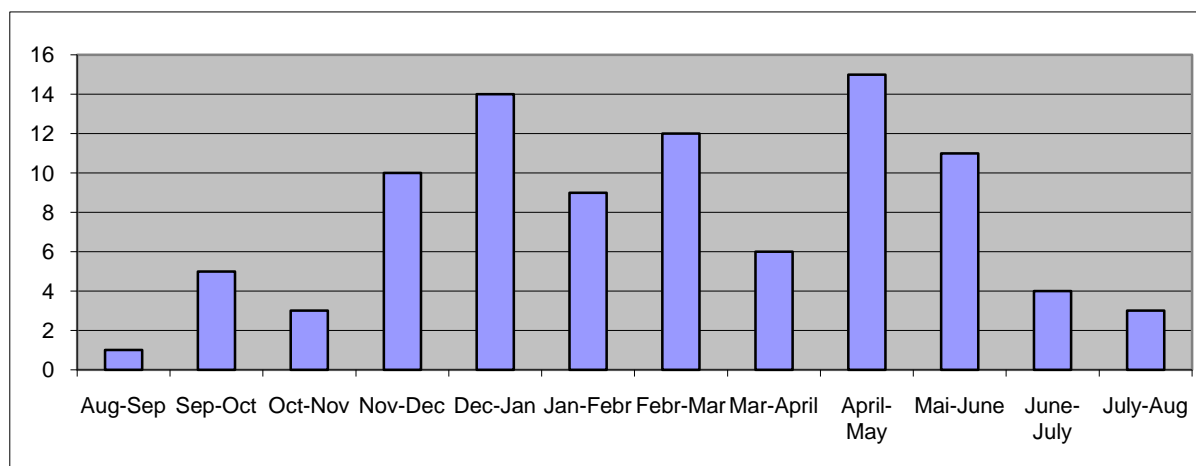
3.2.3 Forest management practices

A critical issue in certification of NTFPs from primary forest ecosystems concerns the nexus between the level of utilization of the NTFP and the conservation and sustainability of the forest ecosystem including its biodiversity. As the Ethiopian forest coffee is both, an important local cash crop and national export commodity as well as a natural component of a forest ecosystem which is highly endangered, this issue plays a considerable role in this research.

The market sells no ‘totally’ wild coffee. All Ethiopian montane rainforests from which coffee is used at an economically relevant scale are managed to a certain degree (Senbeta 2006). Levels of human interference, however, vary considerably, geographically and over time. The data collected in this survey show that the ‘standard’ management in the respective coffee forests in Kaffa and Bench-Maji Zone includes slashing the forests’ undergrowth, transplanting coffee seedlings from one place in the forest to another or into garden production systems and cutting larger trees to provide the coffee with more sunlight.

86% of the interviewed cooperative members said that they cut the forests’ undergrowth (n=57). The average cutting frequency is 2.5 times in a year. The following figure shows the variation of slashing activities over the year. Interviewees were asked in which month they cut the forests’ undergrowth in their coffee forest. (n = 46). Months are transcribed from the Ethiopian calendar. The y-axis shows the absolute number of mentions per months.

Figure 4: forest slashing activities over the year



Source: Own survey.

Figure 4 shows that producers slash the forests' undergrowth throughout the year. Seasonal peaks are during the Ethiopian summer (Dec-Jan) and after the dry season (April-May). The main purpose of slashing the undergrowths is to eliminate competitor plants and to get better access to the site when harvesting. One farmer explained: *"In gibot (May-June) and meskerem (Sep-Oct) we slash the undergrowth to increase coffee yield. In hiddar (Nov-Dec) we slash to get access to the site."*¹² Removing the undergrowth of larger forest tracts is quite time consuming. The average labor burden per interval per household was 11 person-days in the Kaffa Union coops and 67 person-days in Gzmeret coop of the Bench-Maji Union. Accordingly, the peasants that reported not to slash the forests' undergrowth reasoned that with labor shortages (*"It is too much work, I cannot do it on my own and I have no money to pay laborers."*).¹³

82% of the forest coffee users reported to transplant coffee seedlings (n=57) and 62% of the forest users answered that they cut trees to provide the coffee with more sunlight (n=46). In general, forest management is most intensive in Gzmeret cooperative where the work load goes beyond the capacity of a single peasants' household or neighborhood working groups (see Stellmacher 2007a for an in-depth discussion on the role of working groups in use and management of the Ethiopian coffee forests). Accordingly, members of Gzmeret coop acquire additional workforce. There are two ways to organize additional workforce, namely contractors and collectors. Contractors are paid cash for forest management, e.g. 100 birr for slashing the undergrowth of one hectare of forest. Collectors are paid in kind, e.g. get half the harvest for the combined work of slashing the forest and collecting the coffee.

All these forest management activities have an impact on the forest ecosystem and biodiversity. As long as activities are infrequent and the vegetation is given time to develop back into mature forest, human disturbance mimics natural gap dynamics and will not sustainably deplete the forest ecosystem. The forest management activities conducted by the cooperative members, however, go far beyond that threshold. They are frequent and intense interventions not only bringing the notion of 'wild' coffee ad absurdum, but in the long run leading to degradation and fragmentation of the forest ecosystem and reduction of its natural species composition (Schmitt 2006; Senbeta 2006).

In order to assess the long term development of the forest management intensity, the respondents were asked if they manage the forest more intensively in 2006/7 than in 2001/2.

Table 3: Change of management intensity in the last 5 years

Q: Do you now manage the forest more intensively now than 5 years before?			
Cooperative	Yes	No	N
Certified Fairtrade + Organic			
Medfegna	5	2	7
Certified Organic			
Chiri	6		6
Certified Utz			
Gzmeret	9	3	12
Non-certified			
Yeyebitto	6	1	7
Kaya Kela	3		3
Total	29	6	35

Source: Own survey.

¹² Interview number 22.

¹³ Interview number 1.

This data provides evidence that the forest coffee production systems are subject to intensification. The overall majority of peasants in both, certified as well as non-certified cooperatives increased their forest management activities in the last five years. In order to evaluate the underlying motivation behind this behavior, the 29 respondents who said that they manage the forest more intensively in 2006/7 than five years ago were asked about the reason for doing so. The question was open and multiple choices possible.

Table 4: Reasons for intensified forest management

Cooperative	Why do you manage the forest more intensively?						
	High prices	More yield	Better roads	Lack of alternative income	Age of coffee plants	Better know how	Do not know
Certified Fairtrade + Organic							
Medfegna	5						2
Certified Organic	5						4
Chiri							
Certified Utz							
Gzmeret	4	2		1	1		
Non-certified							
Yeyebitto	2	2					
Kaya Kela	5		1			1	
Total	21	4	1	1	1	1	6

Source: Own survey.

21 (72%) of the 29 respondents who increased the management did so because of high producer prices. Other reasons of intensified management as productivity, infrastructure, the lack of income alternatives, or the age of the coffee plants play a minor role. The data does not show significant differences between certified and not-certified cooperatives.

But what happens in the contrary scenario, when coffee prices go down considerably? Do peasants stop using forest coffee if prices are too low? When being asked the question ‘below what price would you stop collecting forest coffee?’ respondents rather reacted with amusement than with a concrete price definition. 85% of the respondents (n=47) noted that they would never stop harvesting forest coffee below any price. The others stated extremely low thresholds, with an average of 7 birr per feresula. Nevertheless, one has to bear in mind the high dependency on this cash crop (“I would never stop [collecting forest coffee]. It is my only source of income”) and that peasants utilize forest coffee also for own consumption (“even without payment, I would collect [forest coffee] for my own consumption”).

Data shows that higher prices encourage producers to invest in additional forest management in order to increase sales and profits. Price boosts increase the level of resources devoted to the management of forest coffee, as e.g. the amount of labor and capital to cut competing undergrowth and excess trees as well as the intensity with which coffee plants are harvested. But what prices do the producers actually receive? What is the net benefit of certification for the producers? To elaborate on these topics, in the following, the financial benefits that members of certified and non-certified cooperatives receive from forest coffee production in general and certification in particular, are identified and compared.

3.2.4 Producer prices and price premia

All cooperative members are free to sell their coffee either to the local coffee cooperatives or to private merchants. Cooperatives pay farmers a first payment on delivery followed by a dividend

(second payment) after the coffee has been successfully sold to consumers and the cooperative received a return payment from the Union. Private merchants buy and pay directly on-farm or on the local markets. They generally draw lower standards on coffee quality than cooperatives, e.g. if the berries were collected at the right degree of ripeness.

In the following, the prices that forest coffee producers received in the season 2006/7 are compared for certified and uncertified cooperatives. Farmers were also asked about the prices they received in the season 2001/2 when none of the coops was certified. If the cooperative members also sold their coffee to private merchants in the respective season, these prices were recorded separately. 57% of the interviewed cooperative members reported that they sold their coffee to both, cooperative and merchants in the last season. 11% sold only to the merchants.

Table 5: Producer prices paid by cooperatives and private merchants

Cooperative	Coop prices paid for harvest 2006/7	n	Merchants' prices paid for harvest 2006/7	n	Prices: 5 years before*	n
Certified Fairtrade + Organic						
Medfegna	116	11	120	6	47	3
Certified Organic						10
Chiri	110	7	109	8	37	
Certified Utz						
Gzmeret	42 ('red cherry' ¹⁴)	10	115	10	35	11
Non-certified						
Yeyebitto	114	9	123	3	42	7
Kaya Kela	109	5	107	3	21	3
Total	113¹⁵	32	115	30	37	34

Note: All prices are average prices in *birr*¹⁶ per *feresula*¹⁷ of dried unprocessed coffee (farm gate weight). They were obtained from 34 farmers in five cooperatives. *not inflation adjusted

Source: Own survey.

Table 5 shows that the producer prices for forest coffee in all examined coops increased tremendously between 2001/2 and 2006/7. On average, farmers received three times higher prices than five years before. However, no significant price difference between certified coops and the non-certified cooperatives could be observed. In addition, it can be seen that prices paid by cooperatives and merchants in the season 2006/7 were similar. While coops paid an average of 113 *birr* per *feresula* of dried coffee, private merchants paid 115 *birr*.

Although the data needs to be interpreted with some caution as the sample size of the survey is small, these findings reflect the general world market trend for coffee. In the same time span the weighted average indicator prices for mild Arabica green coffees at the international coffee exchange in New York increased from 60.43 in 2002 to 123.2 US cents per lb (net weight) in 2007 (ICO 2008).

In contrast to the private merchants, the cooperative system, however, stipulates a profit distribution to its members in the form of a cash dividend (second payment). By nature, the amount and time of the dividend disbursement is not fixed. The coffee picking season in South-western Ethiopia is around November/December. This field survey was undertaken in October/November 2007 and referred to the coffee being produced in the season 2006/7, hence almost one year before. Farmers were asked when they got the last second payment. Only the farmers who sold their coffee

¹⁴ The figures for 'red cherry' can not be compared with those for dry coffee as 'red cherry' refers to the wet processing method.

¹⁵ Without Gzmeret ('red cherry').

¹⁶ Ethiopian currency. In December 2007, 100 Ethiopian birr were equivalent to 7.62 EUR.

¹⁷ A local weight unit equivalent to 17 kg.

in the season 2006/7 to the cooperatives were asked. Questions were posed using the Ethiopian calendar.¹⁸

Table 6: Payment to the farmer who sold coffee to the cooperative in the season of the Ethiopian calendar 1999 (2006/7 Greg. Cal.)

Cooperative	Year of last payment							n
	1999	1998	1997	1996	Earlier	Never	Don't know	
Certified Fairtrade + Organic								
Medfegna		1	5	1	1	2	1	11
Certified Organic								
Chiri				3		3		6
Certified Utz								
Gzmeret	7	2	2				2	13
Non-certified								
Yeyebitto			6			4	2	12
Kaya Kela		2	2		1			5
								47

Source: Own survey.

Table 6 gives evidence that members of the cooperatives in Kaffa Zone have not had received any dividend for years, whereas most farmers in the Gzmeret cooperative received a dividend in the Ethiopian year 1999 (2006/7 Greg. Cal.). There is no evidence on the difference between certified and non-certified cooperatives in this regard. Except for the Gzmeret cooperative, farmers of all cooperatives complained about problems in receiving a dividend for their coffee. A member of the Chiri cooperative committee, for example, complained: *“People complain that they do not get their benefit, but the coop says there is no profit, I am a [coop] committee member but also for me there is no transparency about the benefits and costs”*. Farmers tend to expect the second payments as the main benefit they get from the coop system, since direct producer prices of coops are not considerably higher than those of merchants. A farmer from Medfegna coop explained: *“The coop pays a low price, merchants pay better. But I sold to the coop because I expected a benefit, but the profit is not coming”*.

The cooperative chairpersons, in turn, blamed the union when confronted with these complaints. One cooperative chairman stated: *“The union did not pay the dividend to the coop. All coops in the Kaffa Union have this problem.”* On the next higher level, the chairman of the Kaffa Union argued: *“The coops are to blame. Also the Fairtrade inspectors found out that there are problems with the payment of the dividend.”*

It has to be concluded that in the time period evaluated in this survey, the certification activities of the concerned cooperatives in the Kaffa Zone did not bring a significant financial benefit to their members. Also other economic benefits like improved market access or security were not observed. However, the farmers were also not aware of any costs of certification which need to be considered when calculating the net benefits.

What is the nexus between the price level paid to the producers and their consequential production behavior? On the one hand, one can argue that increased prices paid to producers because of

¹⁸ Ethiopian New Year's Day (addis amahd) falls on the September 11th. From September 11th to December 31st, the Ethiopian calendar year runs seven years behind the Gregorian calendar, thereafter the difference is eight years. In this research, farmers used the Ethiopian calendar. In order to avoid data loss due to translation, some data is given in the Ethiopian calendar.

certification could lead to an intensification of forest management at the expense of primary forest depletion and loss of biodiversity. On the other hand, higher prices may also provide stability for farmers making expansion less necessary. However, while a comprehensive elaboration on the forest coffee price - forest ecosystem and biodiversity correlation deserves further research, this survey provides evidence that supports the first argument. This result confirms what Philpott et al. (2007) found, namely that fair trade coffee did not necessarily protect biodiversity.

3.2.5 Producers' awareness of certification

Successful implementation of certification schemes are based on information exchange and actors' capacity building. This section concerns the question of how producers perceive and understand the process and goals of certification. In the producers' survey, the members of certified coops were asked on their information level in this regard. The first question concerned their knowledge if certification audits have been implemented.

Table 7: Producers' information on visits of certification inspectors

Did an inspector from a certification company ever visit the cooperative?

Cooperative	Yes	No	I don't know	n
Certified Fairtrade + Organic				
Medfegna	8	3	1	11
Certified Organic	6	4		10
Chiri				
Certified Utz				
Gzmeret	2	6	4	12
Total	16	13	5	33

Source: Own survey.

In each certified cooperative, audits have been conducted several times. However, only about half of the members of the cooperatives concerned knew that a certification officer ever inspected the coop. The figures differ extremely between the coops. 72% of the members of the Medfegha cooperative knew about the visit of the certification inspector, while it was 60% in Chiri and only 16% in Gzmeret.

The next question concerned the knowledge of cooperative members on what certification means. Surprisingly, none of the 61 farmers could give a reasonable answer. 22 (73%) answered frankly with "I don't know". Others gave erroneous answers, like "certification permits the cooperative to buy and sell coffee" or "certification means that the coop gets loan from government to give it to its members". These findings reveal general deficiencies in information transfer and capacity building on certification. However, one has to keep in mind that the levels of formal education in these areas are very low.

Additional interviews with cooperative chairpersons and board members, union chairpersons and certifiers in Addis Ababa showed that the understanding of goals and standards of certification is extremely unequally spread among the actors of the value chain, and ends latest at cooperative committee board's level.

4 Conclusion and further research needs

Millions of smallholders in tropical countries secure their livelihoods from forestry and agro-forestry. Simultaneously, a constant loss of tropical forest cover and biodiversity is observed worldwide. Tropical forests are nested in the intersection between the United Nations conventions on climate change (UNFCCC), land degradation (UNCCD) and biodiversity conservation (CBD). Consequently, much emphasis is given to development and implementation of strategies to promote sustainable use and conservation of the remaining tropical forests and biodiversity worldwide. Certification is one strategy to establish positive links between the marketing of forest products, the livelihood of the forest users and the provision of forest ecosystem functions and services.

Forest coffee that grows in the montane rainforests of Ethiopia, the cradle of Arabica coffee, is an NTFP with a number of particularly positive features. It is worldwide unique, with a specific flavor and an authentic and positive image. Since 2002, a growing number of stakeholders engage in certification of Ethiopian forest coffee. The units of certification are local coffee cooperatives that are organized under cooperative unions.

This paper provides empirical evidence on the situation on the ground. Based on interviews conducted with forest coffee producers and concerned stakeholders in nine certified and non-certified coffee cooperatives in Kaffa Zone and Bench-Maji Zone of South-western Ethiopia, the paper illustrates that current activities to certify forest coffee cooperatives in Ethiopia face some practical performance problems and a conceptual dilemma.

A problem of practical performance concerns the benefits that producers gain from certification. While private merchants even paid slightly more for the coffee than cooperatives in the season 2006/7, the cooperative system stipulates a profit distribution in the form of a dividend (second payment) to the cooperative members. Most farmers in Gzmeret coop of Bench-Maji Union received a benefit in the year 2006/7. The farmers in Kaffa, however, both in certified and non-certified cooperatives, stated that the payments have not been paid to them for several years. As cooperative members are free to sell their coffee either to the cooperatives or to the merchants they will choose the economically best option for them. If these are the merchants, the cooperative-union system will in the long run not only lose credibility but its production basis, hence the system would erode from the bottom.

A rather conceptual dilemma of forest coffee certification is the price-forest management nexus. The local population traditionally produces forest coffee in relatively low quantities with extensive management. The used coffee plants are not growing 'wild' as the producers undertake regular and frequent forest management activities - e.g. slashing the forests' undergrowth and cutting larger trees to provide the coffee with more sunlight - in order to increase their yields. The majority of coop members in both certified and non-certified cooperatives intensified their forest management activities in the last five years. Most did so because the prices tremendously increased in this time span. In the long run, these activities lead to an irrevocable degradation and fragmentation of the forest ecosystem and its biodiversity. This can already be observed in many of the coffee forests.

If the farmers would receive prices above the world market level because of certification, this would even increase the incentive for them to intensify their forest management activities – with negative effects for the sustainability of the forest ecosystem and its biodiversity. This opens a catch 22. On the one hand certification aims at paying producer prices and premiums that are in total higher than those of non-certified cooperatives or private merchants. On the other hand, higher prices promote the long-term transformation of the last remaining primary coffee forests into agro-forestry coffee plantations.

This opens the question on the appropriateness of certification concepts. Different products are produced under different ecological and socio-economic backgrounds, posing different challenges on

certification. Fairtrade and Utz Certified standards have been developed for and are most widely applied in intensive agricultural production systems, like coffee plantations in Brazil. Coffee production in Ethiopia, however, describes a different ecological, socio-economic and institutional situation. Even more challenging is the certification of NTFPs from tropical rainforests. These forests are highly multifaceted, cohesive and dynamic systems which services and functions are difficult to operationalize, measure and monitor. The use and management of one NTFP often impacts on other timber and non-timber forest products and the forest ecosystem and its biodiversity as a whole.

Another challenge of certification concerns information. The empirical data has shown that certification is not actively promoted nor understood by those who are certified. Members of the certified cooperatives have no or little knowledge on the certification process, its objective and the respective standards. Half of the farmers in certified coops did not know that a certification inspector ever visited the coop. None of them could give a reasonable answer to the question what certification means.

By nature, certification is not easy to understand. The complexity and differences of the certification standards is often confusing for consumers and producers alike, be it in rural Ethiopia or European supermarkets. However, in the long term any certification activity will not reach its goals when those who are certified are not adequately involved and knowledgeable. This deserves for investments not only in improving the capacity of producers to better understand the certification goals and standards, but in promoting their active participation in the certification process from the beginning.

Research is fundamental for the development and improvement of certification standards, and the monitoring of their implementation. This is especially the case when certification takes place in remote areas of developing countries, under challenging socio-economic, institutional and political circumstances.

Certification is a new development in Ethiopia, so is research on certification. The empirical findings presented in this paper point towards the need of follow-up research. Two fields of research are considered particularly important. First, more in-depth research is needed on the underlying economic and institutional incentives of certification with regard to the sustainable use and conservation of coffee forest ecosystems and biodiversity. This will critically contribute to the current interdisciplinary academic discourse on incentive mechanisms to conserve ecosystem services and functions. Second, more research – especially qualitative one - is needed on the local embeddedness and participation of producers in the certification movement. Local level decision making processes are cross-cutting issues in both fields.

Beyond academic value, research findings ought to have policy relevance. The integration of the outcomes from different studies using different methods would allow for the development of recommendations and concepts to improve the practical performance, efficiency and effectiveness of future certification activities not only for Ethiopian forest coffee but other NTFPs in Africa and beyond.

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