AGRICULTURAL COMMERCIALISATION IN COFFEE GROWING AREAS OF ETHIOPIA[1*]

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Abstract

The coffee sub-sector is very important to the Ethiopian economy – in 2005, coffee export generated 41% of foreign exchange earnings – and provides income for approximately 8 million smallholder households. Policy attention to the sector was always considerable, and its importance has been renewed in the latest Poverty Reduction Strategy, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP). PASDEP puts forward a development strategy based on accelerated economic growth, part of which is hoped to be achieved via increased smallholder commercialisation and market integration.

This paper addresses commercialisation in selected coffee growing areas in Ethiopia. The objectives of the study were (i) to assess the scale of commercialisation in coffee growing areas and to detect household and farm characteristics which might explain variation in the levels of coffee commercialisation among households; and (ii) to answer two separate questions: why some sampled households didn't take part in output markets (i.e. identify determinants of market entry) and why some households

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sold more products than others (i.e. determinants of market supply). Answering these questions will help to identify policy options promoting market participation and commercialisation of smallholder agriculture.

Agricultural commercialisation was found to be comparatively high in the studied Weredas (Districts). On the average, farmers marketed 84% of their farm production. Overall, coffee contributed 70% to the total value of output sold. There is, however, a high inter-household differentiation: the 25% highly commercialised smallholders generated over 95% of their cash income from coffee sales, while the bottom 25% earned 63% of their cash income from selling food crops. Keeping other factors constant, the total volume of farm production explained about 72% of the variation in the degree of commercialisation among sampled farm households. Demographic and household factors, wealth and total farm size had no effect on the observed variation in the degree of coffee commercialisation among sampled households. A negative and significant association between the level of household coffee commercialisation and land productivity in non-coffee crops was found, indicating potential trade-offs between the production of coffee, the major cash crop, and other, mainly food crops. No evidence was found of increasing labour intensity as a result of increased coffee production. Similarly, the degree of coffee commercialisation was found to have a statistically insignificant effect on household-level food consumption.

Overall, the findings demonstrate the integrated nature of the farming system in coffee growing areas. Despite an overall high level of coffee commercialisation, diversified farming is a strategy pursued by the majority of the surveyed households. The study findings, however, suggest that further specialisation in coffee could enhance overall agricultural commercialisation in the study areas.

As the propensity to supply more coffee is significantly higher among households depending more heavily on purchased food, minimising the trade-offs in the production of coffee and non-coffee staple food crops, especially in the short-term, is very important, which signifies the importance of addressing risks associated with food supply and price. In general, increasing smallholder coffee commercialisation is expected to be a viable pathway for agricultural development in coffee growing areas of Ethiopia, if the problem of low productivity, barriers for production expansion (e.g. shortage of farm land or constrained access to farm land) and addressing market risks in both the food and coffee market are addressed by increased research and policy attention.

1. Introduction –Coffee in the Ethiopian economy

Ethiopia produces and exports one of the best highland coffees in the world. The coffee sub-sector is very important to the Ethiopian economy, and generated about 335 million USD or 41% of the foreign exchange earnings in 2005 (NBE, 2006). The coffee sub-sector is also important in terms of providing income for a large number of households: it is estimated that between 7.5 and 8 million households depend on coffee for a considerable share of their income, and provides jobs for many more people in coffee-related activities (e.g. coffee processing, transporting or marketing). It is estimated that the sub-sector impacts on approximately 15% of the population, and around 20% of the land area (McMillan et al, 2003).

In Ethiopia, coffee is primarily cultivated by smallholders, either cultivating coffee on their own farms or picking semi-wild/wild coffee. Of the estimated 600,000 hectares of land cropped with coffee, over half is semi-forest/forest, or semi-wild/wild land. Approximately 235,600 hectares are under smallholder cultivation, ('garden' or 'cottage' coffee), which is generally inter-cropped with food staples. Smallholder coffee accounts for approximately 95% of total coffee production. There are about 20,000 hectares of plantation coffee, consisting mainly of state farms, but increasingly also of plantations under private ownership (McMillan et al, 2003).

Coffee growers in Ethiopia have been exposed to price fluctuations and impacts of unpredictable and uncontrollable shocks. Despite some improvement of producer prices in the past two years, domestic and world coffee prices have declined and remained very low for much of the late 1990s and early 2000s. The effect of this price decline was manifested in increasing poverty among coffee growers, who previously were able to reap good benefits from their coffee sales. At household level the impact of depressed prices has been considerable, leading to distress sales of assets such as cattle, or to uprooting coffee plants and replacing them with annual food crops (Oxfam, 2002) or cash crops such as *Chat*[4]. Other strategies included giving up traditional shade coffee production to create space for intercropping and income diversification (McMillan et al, 2003).

[4] Chat is a plant with stimulant properties.

2. Government policy on agricultural commercialisation

Smallholders cultivate over 96% of the total agricultural land. The average smallholder cultivates less than one hectare of arable land, and consumes more than 65% of total production within the household (EEA, 2006). In many parts of the country, market participation of smallholder family farms (measured either in terms of per capita market share, the volume of farm output supplied to markets or their profit motive) is limited. Agricultural markets are fragmented and not well integrated into a wider market system, which increases transaction costs and reduces farmers' incentives to produce for the market. Government policy - or the lack of it - has contributed to this general characteristic of the smallholder agricultural sector in Ethiopia. Agricultural commercialisation was not high on the policy agenda until recently, as Government rather prioritised ensuring food security and poverty reduction at household level. [5]

The second PRS, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), formulates a more pronounced strategy towards smallholder commercialisation. Commercialisation of agriculture and the growth of the non-farm private sector are two main thrusts of the initiative to accelerate growth for the next five years (2005/06-2009/10). PASDEP also recommends specialisation both at farm and community level, a shift to high-value crops, promotion of niche high-value export crops, a stronger focus on selected high-potential areas, supporting the development of large-scale commercial agriculture where it is feasible, and facilitating the commercialisation of agriculture, among others, through improved integration of farmers with markets - both local and global (MoFED, 2006).

Current Government policy on commercialisation focuses both on small and large farms. An earlier policy document published by the government in 2003 making reference to commercialisation (see Demese Chanyalew, 2006) has substantiated this strategy which revealed two broad paths for the commercialisation of Ethiopian agriculture: commercialisation of smallholder agriculture through market-led production, and commercialisation via the emergence, growth and expansion of modern agricultural enterprises. Despite the various challenges that could hinder further development (e.g. those related to the land policy, shortage of farmland, high

[5] Some criticism has been directed towards the exclusive government focus on poverty reduction and food security at household level at the expense of a more balanced and broad economic growth strategy including urban development, increased agricultural commercialisation and labour productivity (Cour, 2003; Dessalegn Rahmato, 2005; Samuel Gebreselassie 2006).

population growth and lack of non-farm employment), some progress is being made in both cases. The second type of commercial farm is indeed emerging and expanding especially with investments in horticulture and floriculture.

Beyond marketing support, which is elaborated in more detail in PASDEP, government policy is not very clear on how the potential benefits of increased smallholder commercialisation could be maximised and the potential damage minimised. What is called for is a stronger focus on creating an enabling economic environment in which smallholders can take advantage of commercialisation opportunities and progressively move away from the widespread subsistence orientation towards a more viable and market-oriented smallholder sector.

The challenge for government policy is to identify and facilitate strategic pathways and driving forces of commercialisation. These include macro and trade policies, market reform, rural infrastructure improvement, and the development of a legal and contractual environment in which farmers and other actors along the value chain may cooperate. Moreover, policies and institutions are required to deal with the risks of policy and market failures, deficiencies in the knowledge and information of actors in production, processing and marketing at all levels, and household- and community-level complexities including shortage of farm land, high population growth, lack of alternative employment, and the challenges related to state ownership of rural land (i.e. inability to mortgage land and generate capital for its development, unfair and non-transparent land confiscation for large investments or public use, etc.). Policies and institutions related to these driving forces will strongly influence the nature and speed of the agricultural commercialisation process and the transformation of the current agricultural system.

This study does not focus on the broad policy debates with regard to smallholder commercialisation (for further details see Leavy & Poulton, 2007), but concentrates on the commercialisation of smallholder agriculture in Ethiopia's coffee growing areas. Smallholder coffee farming, which has been an important pillar of the Ethiopian economy for centuries, has been confronted with various problems both internal (e.g. weak markets, insufficient infrastructure, insufficient research and extension, shortage of farmland) and external (e.g. global coffee price decline, increasing food and oil prices), which threaten the further expansion of a dynamic and commercially oriented smallholder coffee sub-sector.

3. Context, objectives of the study, conceptual framework and methodology

3.1 Context: Future Agricultures and Commercialisation(s)

Research on coffee commercialisation in selected Weredas was carried out in the framework of the **Future Agricultures Consortium** (FAC). FAC is a partnership between research-based organisations in Africa and the UK, with work currently focusing on Ethiopia, Kenya and Malawi.[6] The Consortium aims to encourage critical debate and policy dialogue on the future of agriculture in Africa. Through stakeholder-led policy dialogues on scenarios for agriculture, informed by field research, the Consortium aims to elaborate the practical and policy challenges of establishing and sustaining pro-poor agricultural growth in Africa. Current work focuses on three core themes:

- ***Policy processes:*** what political, organisational and budgetary processes promote or hinder pathways to pro-poor, agriculture-led growth? What role should different actors, including Ministries of Agriculture, have in this?
- ***Growth and social protection:*** what are the trade-offs and complementarities between growth and social protection objectives?
- ***Agricultural commercialisations:*** what types of commercialisation of agriculture both promote growth and reduce poverty? What institutional and market arrangements are required?

The third theme is entitled commercialisations (plural) to reflect the view that there are several possible types or pathways of commercialisation. Similarly, the plural in the Consortium's name (Future Agricultures) expresses a conviction that pro-poor agricultural development is complex and takes varied locally specific forms.

As part of this overall programme of work, Future Agricultures (Ethiopia) co-organised a parallel session on *Commercialisation of Smallholder Agriculture* at the 2007 EEA Conference. This paper is one of four linked outputs from that session, the other three being:

- a thematic framework paper discussing the meanings and definitions of commercialisation from conceptual and international perspectives (Leavy and Poulton, 2007);
- a brief overview of the policy context and the available (alternative or complementary) pathways of agricultural commercialisation in Ethiopia (Sharp, Ludi and Samuel Gebreselassie, 2007); and

[6] For further information and news, see www.future-agricultures.org

- an empirical paper on smallholder commercialisation in Ethiopia's tef-growing areas (Samuel Gebreselassie and Sharp, 2007), which closely parallels the present paper and draws on the same methodology and framework outlined below.

3.2 Objectives

The objectives of the study are

(i) to assess the scale of commercialisation in coffee growing areas and to detect household and farm characteristics which might explain variation in the levels of coffee commercialisation among households;

(ii) to answer two separate questions: why some sampled households did not take part in output markets (i.e. identify determinants of market entry) and why some others sold more products than others (i.e. determinants of market supply).

Answering these questions will help to identify policy options promoting market participation and commercialisation of smallholders' agriculture.

3.3 Conceptual framework: smallholder commercialisation in Ethiopia's coffee and tef areas

The study focuses on smallholder farmers producing coffee or tef, both important to the national economy, and both grown and marketed by smallholders for generations. Some contrasting and overlapping characteristics of these commodities are summarised in Table 1.

Table 1: Commodity choice - characteristics of coffee and tef

Coffee	Tef
Non-food	Food (high value)
High policy attention & intervention*	Limited policy attention & intervention*
Mainly small scale production, some large estates	Small-scale production
Productivity strategy: niche markets (speciality, organic), low chemical input	Productivity strategy: purchased fertilisers (and seeds)
Labour intensive with seasonal labour bottlenecks	
New institutions: Cooperatives and Unions	
*Research & Development, market support and control, etc.	

Commercialisation of smallholder agriculture involves a transition from subsistence-oriented to increasingly market-oriented patterns of production and input use.

Agricultural commercialisation is defined in terms of the degree of participation in the market. This can be measured either in terms of the total volume or proportion of output sold in markets, or the total volume or proportion of purchased inputs in total inputs utilised on the farm, or both. The vast majority of studies on smallholder commercialisation measure the level of commercialisation in terms of the proportion of output sold in markets. A value of zero would imply a totally subsistence-oriented household; the closer the index is to 100, the higher the degree of commercialisation[7] (for details see Leavy and Poulton, 2007).

Box 1: Household commercialisation and household coffee commercialisation indices

Household Commercialisation Index

$$\text{HCI} = \frac{gross\ value\ of\ all\ crop\ sales}{gross\ value\ of\ total\ crop\ production} * 100$$

Household Coffee Commercialisation Index

$$\text{HCCI} = \frac{gross\ value\ of\ coffee\ sales}{gross\ value\ of\ total\ crop\ production} * 100$$

3.4 Methodology

This paper is based on data collected in 2006 and early 2007. Quantitative data on production, consumption and marketing activities and resource ownership were collected from 160 farm households in four major coffee growing Weredas (Districts) in Oromia (Gomma and Gimbi Weredas) and Southern (Yirgachefe and Aleta Wondo Weredas) Regions. For the qualitative scoping study in early 2007, one Wereda was chosen purposively (primarily on grounds of logistics and accessibility, given severe limitations of time).

For the household survey, a stratified two-stage sampling design was employed within each Wereda. First, Kebele Associations (communities) found in the selected Weredas were listed and two associations were randomly selected. Then, in the

[7] However, this index could be misleading: a farmer who grows only 1 bag of maize and sells that bag could be considered as more commercialised than the one who grows 50 bags of maize and sells 30 of them. Under ideal conditions, the two measures (the total volume of crop sold and the proportion of crop sold) should be used together through development of a composite index.

second stage, twenty households were randomly selected from each Kebele for the interview. As the study aimed to look also at gender-related disparities on agricultural commercialisation, it was decided to include at least 25% female-headed households in the survey. The survey applied both a purposive and random sampling method. Using structured questionnaires, households were also interviewed about demographics, non-farm activities, asset holdings, and attitudes and perceptions about different issues related to the subject of the study. Interviewees and focus group members in the scoping study were identified through local contacts, based on purposive criteria provided by the researchers.

After preliminary analysis of the survey data, a qualitative scoping study was conducted in one surveyed coffee Wereda (Gomma), in February 2007. The purpose was to follow up some questions raised by the survey, and to identify important policy-relevant issues which had not yet been explored. The methods used were open-ended, semi-structured focus groups and individual interviews around the following themes:

- **Opinions and perceptions** – e.g., what do people consider the advantages and disadvantages of producing for the market, compared to producing for their own consumption?
- **Reasons for selecting specific strategies** – e.g., why do some farmers sell more of their produce than others? What factors encourage or discourage increased market engagement (selling of outputs, buying of inputs)? What kind of people are succeeding in making a profit from farming? What kind of support do farmers need from the government and other organisations, in order to increase their access to markets or to improve their terms of engagement with the market so that farming becomes more profitable for them? Do people *want* to sell more of their produce in the future? Why, or why not?
- **Employment effects** of different commercial crops – e.g. what kinds of people are employed on marketed crops? What type of work is done by local people, or by migrants? By men, women, or children? How much do they earn? What are the conditions of work? Are these considered good jobs, do people want to do them?
- **Changes over time** – e.g. what changes in farming and marketing conditions have people seen in their lifetimes? Has the market become more or less important for farmers than it was in the past? What hopes and expectations do they have for the future? Do they think farming in this area will become more market-oriented, and if so, what will the effects be?

Both descriptive and econometric methods were employed for the quantitative data analysis. Descriptive methods including measures of average and a one-way ANOVA were employed to estimate the scale of commercialisation of agriculture and to test the existence of any statistically verifiable difference among farmers operating at different levels of commercialisation. Results from the discrete one-way analysis were further examined through multivariate regression models which helped to predict the determinants of commercialisation and its impacts on the consumption and productivity of smallholders.

4. Survey findings

4.1 Cropping pattern and crop mix

The average farm size in the study areas was about 1.2 hectare, of which on average 0.63 ha was under coffee. Survey data indicate that about three-quarters of the smallholders in the study areas planted coffee. Coffee is the dominant crop in the surveyed areas - no other crop occupies a similarly large area of the farm. About 38% of coffee plots were intercropped with annual crops like maize, tef, wheat, peas, and vetch, and perennial food and cash crops such as Chat and *Enset*. When intercropped, coffee occupied only about one third of the plot. This result confirms earlier findings on the small sizes of coffee plots in Ethiopia. For instance, McMillan et al. (2003) found that 36% of coffee is grown on coffee plots less than 0.10 hectares, and another 59% is grown on plots between 0.10 and 1.00 hectares.

Next to coffee, *Enset* (false banana) and maize were grown by the majority of surveyed farmers. Other crops in the cropping pattern include spices, *Chat*, root crops, fruits and vegetables. Most of these non-coffee crops provide coffee growers with products that can be either consumed directly or marketed occasionally on local markets. *Enset,* which is planted by about half of the surveyed households, plays an important role in the livelihood strategies of coffee growers as it serves as an insurance crop, especially in times of coffee price declines or shortage of food grains in local markets, mainly because of its high productivity, resistance to drought and availability almost all year round.

Despite a high degree of coffee commercialisation, crop diversification is an important livelihood strategy of farmers[8]. The average farmer cultivated four to six crops.

[8] The high degree of household coffee commercialisation could obscure the widespread crop diversification that coexists in the farming system of the study areas. This is mainly due to our definition of agricultural commercialisation which, for the purpose of this study, is measured in terms of the value of output sold (but

Coffee, maize, *Enset* and different kinds of fruits were the most common crops in the cropping pattern. Diversified production reduces smallholders' vulnerability to market and production risks and provides them with the opportunity to select a particular crop or crops in order to increase farm-generated income while improving household food security. Smallholders' simultaneous adoption of coffee commercialisation and crop diversification as a household livelihood strategy could be a response to unreliable food markets, high transaction costs and risks associated with increased specialisation in coffee.

Table 2: Cropping pattern among sampled coffee growing households (N=160)

Crop	Number of plots		Number of growers	% of growers	Average plot size under specific crop per grower (ha)
	Overall	Per farmer			
Coffee	346	2.8	123	77%	0.63
Enset	159	1.9	83	52%	0.40
Maize	275	3.5	78	49%	0.58
Fruits	171	3.2	54	34%	0.20
Chat	110	2.6	43	27%	0.34
Eucalyptus	57	2.8	20	13%	0.26
Vegetables	59	4.9	12	8%	0.40
N	160		160		

Source: Own survey, 2006

Despite apparently higher returns to land and labour from coffee production (see Table 4), farmers do not necessarily aim at higher degrees of coffee specialisation at the cost of a diversified cropping system. Results from a number of discussions held with farmers revealed that risks related to specialisation are considered to be too high. Coffee producers try to achieve as diversified an income portfolio as possible. It was pointed out that being highly specialised in coffee production (understood mainly in area terms, i.e. having all of the farmland under coffee) is mainly a result of insufficient land resources. Young farmers inheriting only a plot suitable for coffee cultivation are in a specifically vulnerable position and their high degree of specialisation is rarely by choice.

not in terms of the volume of marketed output or size of farm land planted by different cash and food crops).

4.2 Household income and income diversification

Household income is relatively high in coffee growing areas compared to the national average[9]. The average household generated Birr 5,408 (approx. US$ 600)[10] from farming and non-farming activities. Crop farming contributes 90% to the household income in the study areas, while the remaining income comes from livestock, remittances or aid, and agricultural and non-agricultural employment (see Table 3). Household income from non-agricultural employment was on average 7.4%, which is very low even compared to the national average. A recent publication from the World Bank (2007) indicates that about 24% of rural income in Ethiopia is generated from non-farm income sources[11]. Despite this low level of income diversification, the structure of household income is very similar among different households and was neutral to the level of coffee commercialisation.

Table 3: Household income and income sources

	Household coffee commercialisation [12]				Average
	low <20%	medium 21-60%	high 61-80%	Very high ≥80%	
Total household income (Birr)	4,048	6,429	6,829	5,228	5,408
Per capita income (per adult equivalent) (Birr)	704	1,204	1,196	1,021	1,003
Diversification of income sources (% derived from …)					
Crop farming (coffee and non-coffee crops)	94.8	93.0	91.8	91.8	90.4
Coffee					70.0
Livestock*	-3.7	2.9	0.9	0.5	0.5
Remittances and aid	0.1	0.0	0.1	2.0	0.7
Agricultural employment -	3.0	0.6	0.0	1.6	1.0
Non-agricultural employment	5.8	3.5	7.2	4.1	7.4

* Income from livestock includes income from sale of livestock products, livestock and livestock renting minus any expense for purchase of livestock.
Source: Own survey, 2006

[9] According to a recent study by the EEA the average household and per capita income for rural Ethiopia was Birr 3,303 (US$ 367) and 540 (US$ 60), respectively (EEA, 2006).
[10] US$ 1 = approx. 9 Ethiopian Birr (June 2007)
[11] According to the World Bank, this level of non-agricultural income is very low when compared to countries like Bangladesh (52%) or Ghana (43%), though close to Uganda (26%). The report recommends policy makers to increase this low rate through the creation of opportunities for non-farm activities.
[12] Cut-offs were chosen on the grounds of observing marked differences among interviewed households with regard to commercialisation levels and a skewed distribution with a high number of farmers producing at the higher end of the commercialisation spectrum. A division in three groups (low, medium, high), which is fairly common in the literature, would thus not have made sense.

The average household income seems insufficient to satisfy the minimum consumption expenditure for food and basic non-food items. The average per capita income of about Birr 1,000 is close to the Birr 995 the Government of Ethiopia fixed a decade ago (in 1995/96) as the point of reference for rural poverty. Once again, the lowest per capita income was observed among the least commercially-oriented households, implying the importance of coffee in household income, at least in years when coffee prices remain stable or are high. However, despite their low level of income, the least commercially-oriented households could be better off in terms of coping with shocks, as they have a substantial income from (low-value) food crops and are thus able to minimise long-term vulnerability associated with the risks of fluctuating coffee prices and unreliable food markets.

4.3 Coffee and agricultural commercialisation

Many factors have contributed to the commercialisation of smallholder agriculture. It started as farmers and village communities were incorporated into wider economic networks and political units, often in close relation with the development of infrastructure, expansion of long-distance trade and state formation and government intervention. Other factors that have contributed to the commercialisation of agriculture include variation in ecological conditions which stimulated some degree of specialisation and favoured exchange, the external demand for foodstuff in urban and food deficit areas, migration of people, government policies and technological innovations which facilitated surplus production[13] (Hinderink and Sterkenburg, 1987).

Households in the study areas are heavily dependent on coffee, both as a source of cash income and livelihood. Compared to the national average, they operate at a relatively high level of agricultural commercialisation. In value terms, the average farmer in the surveyed Weredas marketed about 84% of what he or she produced.[14] Ten percent of the sampled farmers operated at full commercial level, i.e. they marketed 100% of their production. At the other end of the spectrum, about 4% of the surveyed farmers consumed all that they produced on the farm. Despite a high degree of commercialisation or market orientation, the value of marketed produce (per household) is small. Fifty-three percent of sampled households sold farm products worth 2,000 Birr (approx. US$ 225[15]) or less, and the average household

[13] The Italian occupation of the country from 1936 to 1941 may also have played some role.

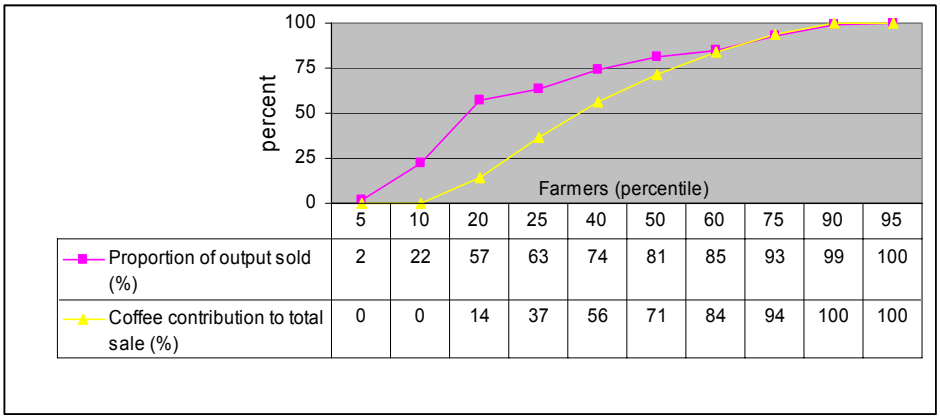
[14] Because the value of coffee is high compared to food crops produced by sampled households, the commercialisation index (measured in value terms) might be overestimated. In other words, if the commercialisation was measured in terms of the output volume farmers supplied to markets, the figure could be closer to the national average.

[15] US$ 1 = approx. 9 Ethiopian Birr (June 2007)

sold products worth only 586 Birr (approx. US$ 65). Only 32% of farmers sold products worth 3,500 Birr (approx. US$ 393) or more.

Household coffee commercialisation was found to be high. The index of household coffee commercialisation, which is defined as the ratio of the value of coffee sold to the value of overall crop produced on the farm, ranged from zero (for 16 households or 10%) up to 100% (for 17 households or 10.6%) across the sampled households, with the mean value being 59%. There is a small variation in the degree of coffee commercialisation among surveyed Weredas (districts). In Gimbi and Gomma Weredas (both Oromia Region), the value of coffee sold comprised 66% and 63%, respectively, of the total value of output produced; whereas in Aleta Wondo and Yirgachefe (both Southern Region), the coffee commercialisation index is 53% and 56%, respectively.

Figure 1: Proportion of output sold and coffee contribution to total sale



	5	10	20	25	40	50	60	75	90	95
Proportion of output sold (%)	2	22	57	63	74	81	85	93	99	100
Coffee contribution to total sale (%)	0	0	14	37	56	71	84	94	100	100

Overall, coffee contributed 70% to the total value of output sold in the market by the average farmer. There is, however, a high inter-household difference in coffee's role as a cash-earning crop. The top 25% of highly commercialised smallholders, for instance, generated over 95% of their cash income from coffee sales, while the 25% least commercialised households earned only 37% of their cash income from coffee and the remaining 63% from sales of non-coffee food crops like maize. The data suggest that some of the farmers are producing food crops to sell to their fellow farmers who are highly commercialised in coffee production.

A single-equation simple regression model specifying sales as a function of production (see Box 2) indicates a significant and positive association between production and amounts sold, both measured in value terms. The regression

coefficient of 0.75 indicates that for a unit increase in the value of production, earnings from sales go up by 0.75. The high coefficient of determination (r^2=0.72) demonstrates that about 72% of the variation in sales can be explained by the volume of production. Section 5 presents further analyses of factors that play a role in farmer's decision whether or not to participate in markets and on the extent of market participation.

Box 2: Sales - production relationship among sampled households

$Y_i = 1{,}710 + 0.75X_i$
$t = (2.20) \quad (19.23)^*$
$P = (0.03) \quad (0.00)$
$R^2 = 72.1$

Despite a high degree of commercialisation, farmers pointed out that diversification (of both crops grown and income sources) is an important livelihood strategy in view of reducing risks. This strategy is feasible because of a diverse agro-ecological environment, and necessary because of high risks resulting from unpredictable climatic, economic and socio-political events. Because coffee is a high-value crop compared to other food and non-food cash crops, it can generate a cash income that otherwise can not be achieved. This could be one explanation why, despite declining and highly fluctuating prices for coffee for the past decade, farmers in the survey areas did not uproot coffee trees. Nonetheless, coffee growers allocated a substantial portion of their land to low risk, but also low value food crops as a hedge against price risks related to coffee, despite some short-term financial loss.

4.4 Characteristics and comparison of highly and less commercially-oriented farmers

One issue for this study was to investigate the effect of farm-size on the level of commercialisation, or whether farm households with smaller farms commercialise disproportionately less than those with larger farms. Results from the bivariate statistical analysis indicate that the total farm size owned and cultivated by the surveyed farmers was not important in explaining observed variation in household coffee commercialisation. More important was the proportion of land planted with coffee. This result highlights two points: (i) the homogeneity of farm sizes among surveyed households, which makes the probability of commercialisation among different farmers comparable, and (ii) the difficulty smallholders face to expand their coffee and non-coffee (notably food crop) production simultaneously.

Table 4 highlights the importance of demographic and household factors for the level of coffee commercialisation. The degree of coffee commercialisation was higher among households with smaller families, households headed by women and households headed by older persons. Households with a higher commercialisation level were smaller (average 5.1 members) than those with a lower commercialisation level (average 5.8 members). About 12% of highly commercialised households were headed by female household heads compared to 4% among the least commercialised. Similarly, the mean age of heads of households with a high coffee commercialisation level was 51, compared to 46 years for the head of a household with a low commercialisation level. However, none of these observed differences was statistically significant. That is, neither the demographic and household factors considered (gender, age, and family size) nor farm size had any significant effect on the observed variation in the degree of coffee commercialisation among sampled households.

Table 4: Household characteristics by degree of Coffee commercialisation

	Household coffee commercialisation				
	<20% (Low)	21-60% (Medium)	61-80% (High)	≥80% (Very high)	F-test
Total cultivated land (ha)	1.12	1.23	1.41	1.09	0.83
Proportion of land allocated to coffee (%)	34	50	54	57	2.77**
HH size (adult equivalent)	5.75	5.34	5.71	5.12	0.86
Age of household head	46	47	52	51	1.16
Sex of household head (% male)	96	92	87	88	0.62
HHs with radio/tape recorder (%)	4	8	20	19	1.61
Number of rooms in house	2.8	2.7	3.3	2.9	0.68
HHs with corrugated iron roof on house (%)	60	73	53	72	0.97
Non-land farm asset ownership (Birr)	688	766	761	1,745	1.38
Labour intensity (person-days/ha)	115	153	147	134	1.02
Share of hired labour (%)	14	16	12	11	0.13
HH commercialisation index (see Box 1)	74	70	91	98	11.58***
N	26 (20%)	26 (20%)	15 (11%)	64 (49%)	

*, ** and *** denotes statistical significance at 1, 5 and 10%, respectively.
Source: Own survey, 2006

Focus group discussions with young and older male farmers and female farmers revealed that young farmers often only receive one plot with coffee trees from their

fathers when they set up their own household. Female headed households obtained their land either during the land distribution during the Derg regime or after the death of their husbands. Women in the focus group discussion mentioned that they leased out crop land because of labour restrictions (women are not allowed to use oxen for ploughing), but kept land under coffee as they could more easily employ labourers during coffee harvest than for other field-work related tasks. The higher level of commercialisation among female-headed households and households with younger heads could thus be explained by their specific land ownership and labour availability situation.

Another key issue is whether household coffee commercialisation had any association with wealth-related variables. The bivariate statistics in Table 3 indicate that highly commercialised households are generally better off in terms of ownership of various non-farm assets (e.g. radio, type of house, non-farm assets), though these differences were not statistically significant. Similarly, household coffee commercialisation was not associated with gross per capita crop and non-farm income, though descriptive statistics indicate that per capita income among households operating at a higher level of commercialisation was high. Despite the high probability of reverse causality between smallholder's wealth and their engagement in potentially risky farming activities such as coffee production, the lack of statistically significant associations in the study areas appears to contradict evidence from elsewhere that commercialisation in non-food crops increases agricultural income. A multivariate regression model was carried out to verify some of these results from bivariate analysis, and this is discussed later in the paper.

Although the difference in ownership of non-land farm assets (mainly livestock and farm tools) among the four groups of farmers operating at different levels of coffee commercialisation is not statistically significant (see Table 4), the least commercialised coffee growers owned only 40% of what the highly commercialised coffee growers owned. This positive relationship between household coffee commercialisation and asset ownership could indicate a positive effect on smallholders' capacity to invest or own more assets. However, the cause-effect relationship could be either way. A high degree of commercialisation in coffee might generate sufficient cash income to allow coffee growers to invest some of this income in assets. An alternative explanation could be that because a high level of commercialisation bears significant market and price risks, coffee growers are forced to acquire assets which can be easily liquidated to finance subsistence needs in times of low coffee prices.

Based on our analysis, we could find no clear indications that would point in the direction of enhanced farm employment as a result of higher levels of commercialisation. Compared to farm households operating at the highest or lowest level of coffee commercialisation, labour intensity was highest among households with a medium commercialisation level (see Table 4). The bivariate statistics indicate that farmers operating at a high level of coffee commercialisation employ more labour (about 20% more) per hectare of farm land than those operating at the lowest level of coffee commercialisation, though the share of hired labour was high among the latter group (Table 4). These differences, however, are statistically insignificant. Explanations for this could be that farm sizes in general and area under coffee in particular are so small that only limited extra-household labour is required even if the area under coffee is increased. Results from the qualitative scoping study, however, raise some different aspects of the employment issue. Extra-household labour demand during peak seasons (e.g. harvesting, processing and selling red coffee cherry, and land preparation and harvesting of grain crops) was mentioned as a constraint to the further expansion of coffee production. A vibrant rural labour market exists in coffee growing areas, with seasonal workers from neighbouring areas migrating to coffee growing areas during peak labour times. Female household heads, however, mentioned that they face increasing difficulties in recruiting sufficient (migrant) labourers during peak times. One reason could also be that young local farmers prefer to work in coffee processing facilities (e.g. washing stations) or to migrate themselves to other areas in search of employment. Further research is needed to establish employment effects – positive and negative – of increased levels of commercialisation of coffee growing households.

Table 5: Productivity and loans among coffee growers operating at different levels of coffee commercialisation

	Household coffee commercialisation				
	<20% (Low)	21-60% (Medium)	61-80% (High)	≥80% (Very high)	F-test
Land productivity in coffee (kg/ha)	225	546	602	450	2.8**
Gross margin in the production of non-coffee crops (Birr/ha)	1,813	1,504	1,479	911	4.35***
Share of purchased food (%) [A)]	73	78	78	72	0.23
HHs taken loan (% yes)	60	54	47	31	2.71**
Average amount of money borrowed (Birr)	376	514	486	561	0.16
N	26 (20%)	26 (20%)	15 (11%)	64 (49%)	

*, ** and *** denotes statistical significance at 1, 5 and 10%, respectively.

Source: Own survey, 2007

[A)] As the survey was conducted towards the end of the cropping season, the reported expenditures on basic food (here expressed as a percentage of total consumption) for one week prior to the survey may overestimate the annual average.

Survey data indicate that participation in the credit market is high among the least commercialised households, but that they received, on average, only small loans. About 60% of the least commercialised farmers had taken loans averaging Birr 376 (approx. US$ 40), while only 30% of the highly commercialised households took loans averaging Birr 561 (approx. US$ 60) (see Table 5). This difference suggests the positive role of a high degree of coffee commercialisation in reducing the need for borrowing (as shown in the lower percentage of households borrowing money), while enhancing the capacity to borrow larger sums.

5. Determinants of participation and extent of participation in output markets: Econometric analysis

Smallholders participate in output markets either to capture the gains that arise from specialisation or because of necessity (i.e. to get cash for the purchase of essential consumption goods and services and agricultural inputs not produced on the farm). In making the decision to participate in markets, they are believed to make a rational choice that can maximise their utility or benefit. The decision to enter markets is influenced by many household (micro) and macro level factors. As discussed earlier, macro- and trade policies, market reform, rural infrastructure and a conducive legal environment are all required for beneficial interaction among the different market players and therefore for advancing the degree of agricultural commercialisation of smallholders.

However, even in situations where farmers operate under the same policy and market environment, not all smallholders participate in output markets. And those participating in output markets do so to a different degree. This study investigates which household-level factors are important for defining market participation and the degree of market participation based on household survey data.

5.1 Modelling market participation

We investigate the factors that influence smallholder's decisions whether or not to participate in output markets. For this we constructed a logit model. Logit models are widely used for predicting the probability of an occurrence of an event. It uses several predictor variables that may be either numerical or categorical. The logistic regression model is used extensively in medical and social science as well as marketing (e.g. predicting a customer's propensity to purchase a product (Gujarati, 2003).

In this study, the model is, however, used to examine factors playing an important role in the observed decision of surveyed farmers to participate or not to participate in output markets. For each household i, i=1, 2….N, y_i = 1 if the household participates in output markets and y_i=0 otherwise. This is conditioned by a K-vector of household-specific covariates, x_i. The decision rule is to participate when the utility of doing so, $U_i(x_i)$, exceeds utility $V_i(x_i)$, which is the utility reaped in return for not participating.

Logistic regression analyses binomially distributed data where the numbers of Bernoulli trials n_i or observations are known and the probabilities of success p_i or occurrence (p_i) are unknown. An example of this distribution is the probability of a farmer to sell or not to sell his/her output from a group of farmers (n_i) surveyed. We assume that this probability can be expressed by the logistic function:

$$P_i = 1 \setminus 1+e^{-(\beta 0 + \beta i\, Xi)}$$

We do not actually observe the latent variable P_i. What we observe is a dummy variable Y_i defined by

$$y_i \begin{cases} 1 \text{ if } P_i > 0 \\ 0 \text{ otherwise} \end{cases}$$

Since each Y_i is a Bernoulli random variable, we can write

Prob (Y_i =1) = P_i
Prob (Y_i =0) = (1-P_i)

The logits of the unknown binomial probabilities (*i.e.*, the logarithms of the odds) are then modelled as

$$\text{Logit } (P_i) = \ln (P_i \setminus 1-P_i) = \beta_0 + \beta_i X_i + u_i$$

The left-hand side of this equation ($\ln(P_i \setminus 1-P_i)$) is called the log-odds ratio. The log-odds ratio is a linear function of the explanatory variables. For the linear probability model it is P_i that is assumed to be a linear function of the explanatory variables. The logistic model was estimated using maximum likelihood estimation technique.

Another commonly used transformation is the probit transformation. In many practical situations, probit and logit give very similar results. The logistic model is used in this study because it is computationally simpler to estimate and interpret. Moreover, the problem of disproportionate sampling is better handled by logit models which don't

demand to weight observation of groups sampled at different rates as the coefficients are not affected by the unequal sampling rates for the two sample groups (it is only the constant term that is affected) (Maddala, 2001).

5.2 Modelling the degree of market participation

Once households have made the decision to participate in markets as sellers, they have to make another decision on how much to sell and at what time (i.e. supply decision). Survey data indicate a wide disparity of the quantity supplied to the market by respondents. Average sales quantities of the top 25% farmers, for instance, exceed by three times what was sold on average by 50% of sampled households. It is important to investigate the factors behind these wide variations. This helps to identify alternative market promotion policy options for different segments of the rural population.

We assumed that the quantity of output sold on the market (measured in terms of cash earned from marketing) is a linear function of a set of household characteristics. Mathematically, the econometric model or functional economic relationship is expressed as the reduced form equation:

$$Y_i = \alpha_i + \beta_i X_i + u_i \qquad \textbf{(Equation 1)}$$

Where Y_i is total value of output (or the proportion of output) sold,
X_i are factors that are hypothesised to affect quantity supplied on the market
α_i and β_i are estimable parameters, and
u_i is the error term.

The explanatory variables assumed to affect the total value of sales (or the degree of farmers participation in the output market) include quantity of on-farm production, price of the commodity in time period t-1, household food security measured in terms of the proportion of own food in total household food consumption, the degree of specialisation in major cash crop (coffee), per capita income from non-farm activities and share of non-farm income in total household income. Market transaction costs could be one of the explanatory variables but it is not considered for lack of data, though the price farmers received (farm gate price) for their major output is supposed to capture the effect of variation in market transaction costs including the effect of farmers' access to market centres.

Farmers engage in non-farm activities to complement their farm income. The level of income from non-farm activities could indirectly indicate farmers' satisfaction with

their cash income from their farming activities, especially if sampled farm households have comparable opportunity or access to available non-farm jobs. Conversely, the level of cash income from non-farm activities could be used as a proxy for farmers' dissatisfaction with their cash income from their farming operations.

Data on farmers' access to non-farm activities and their willingness to engage in such activities is not available. But we have data on income from non-farm activities and we use this as one of the explanatory variable in the regression model. The assumption is that those with non-farm incomes will be selling more of their output when compared with those who have no additional income. This is measured in terms of the level of household income from non-farm sources and its share in total household income. These two variables, therefore, are assumed to affect positively the total value of output sold as the propensity to supply more could increase with higher income from non-farm activities.

On the other hand, the propensity to sell could vary according to the type of major crop produced. Supply decision of farmers who produce non-food cash crop and those who produce food crops which can be sold or consumed on the farm could vary. To reveal any effect associated with this, the degree of farmers' specialisation in coffee was considered as an explanatory variable.

While the level of farm production and farm gate price have a direct effect on the amount of crop sold, in semi-subsistence farming the degree of household food self-sufficiency (here expressed as the proportion of own food in total household food consumption) plays a key role in the degree of their participation in output markets. The assumption is that households that have met their food requirement will be more ready to sell their output. But, this would only be the case in systems where both food crops and cash crops are cultivated. The level of household food security was incorporated into the model as explanatory variable and is assumed to affect the extent of smallholders' market participation positively or negatively.

We estimate Equation 1 by ordinary least square estimator (OLS) after testing whether the error term and the regressors are uncorrelated, which is important for OLS to yield consistent estimates. But in the model specified above (Equation 1), one of the regressors (total value of output) could be endogenous to the specified model which could cause the error term to be correlated with this regressor and thus make OLS an inconsistent estimator.

The Hausman specification test was used to test for the exogeneity of this variable and to determine the suitability of OLS in estimating the above equation or the need

to employ another estimator like the instrumental variables (IV) procedure (also called two stage least square (2SLS)). In order to implement the test, the reduced form equation where the potentially problematic variable (total value of output) is specified as a function of all exogenous variables in the structural equation (Equation 1) and the two proxy or instrumental variables (the size of cultivated land and the number of working adults in the household) was run using the OLS and we retrieve the residual from this regression. Then, the following expanded equation is formulated where the original structural equation (Equation 1) is augmented by the inclusion of the reduced form residual (v_i)

$$Y_i = \alpha_i + \beta_i X_i + \gamma v_i + u_i \qquad \textbf{(Equation 2)}$$

The Hausman specification test was implemented by testing the coefficient of the residual (γ) (i.e. to test whether the coefficient is significantly different from zero or not). A simple t-test was used and the coefficient was found very close to zero and t-test indicates that the coefficient is statistically significant (model results from these regressions are not reported here) so we fail to reject the null hypothesis of exogeneity. Therefore, we used the standard OLS as it could yield consistent estimates.

Table 6: Characteristics of market participants and non-participants

	Market position		
	Participant	**Non-participant**	**T-value**
Household characteristics			
Household head			
▪ age	49	55	1.1505
▪ sex (% male)	91%	82%	1.0446
▪ basic education (% literate)	65%	64%	0.0614
Household size (adult equivalent)	5.4	4.5	1.513
Farm resource and expenditure			
▪ total cultivated land (ha)	1.15	0.69	2.058**
▪ labour spent on farming (person days)	149	77	2.635***
▪ cash expenditure for farming (Birr)	163	49	1.148
Farm production			
▪ Value of output produced (Birr)	6,194	1,818	2.164**
Specialisation in coffee			
▪ Proportion of land allocated to coffee (%)	63%	49%	0.685
Household food security			
▪ Share of purchased food (%)	78%	47%	2.686***
Importance of non-farm income (NFI)			
▪ Share of NFI in household income (%)	12%	0%	1.528
▪ Per-capita income from non-farm activities (Birr.)	86	0.99	1.047
N	128	11	

***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

The estimates of the two regression models are presented in Table 8 and discussed in Section 5.3.

5.3 Results

Despite a high degree of specialisation in coffee production in the selected Weredas, survey data indicate that about 9% of sampled households did not participate in output markets as sellers. These farmers were unable to take advantage from participating in output markets because of either insufficient production and high market transaction costs, or alternative cash income (e.g. non-farm wage labour, remittances), which may weaken their incentive to participate in output markets as sellers. The degree of household food security measured in terms of the proportion of purchased food which also indirectly indicates the cropping mix (staple versus cash crops) is also important in influencing the decision of smallholders' market participation.

Descriptive statistics indicate that heads of households not participating in output markets are relatively older (on average 6 years). We also find a higher percentage of female headed households and smaller households with fewer members among those households not participating in output markets (Table 6). These differences in household-level characteristics, however, were statistically not significant. Conventional farm inputs, like land and labour, were found positive and statistically significant. The likelihood for non-participation in output market is high among farm households cultivating small farms and spending less time for farming activities. Similarly, the total value of farm output produced is significantly higher among households participating in output markets. Households selling a larger share of their production also buy a larger share of their food from markets: 78% in comparison to only 47% of food bough the week before the survey by households not participating in output markets.

Table 7: The degree of market participation among farmers participating as sellers in output markets (N=128)

Percentile (% of household)	Income from marketing (Birr)		
	Average	Minimum	Maximum
10%	6	--	53
20%	159	22	435
25%	364	120	600
50%	1,860	1,049	2,552
75%	5,600	3,539	10,208
80%	7,963	5,191	13,494
90%	18,531	11,510	47,044

Not surprisingly, econometric analysis reveals that farmers' decision on market entry is significantly related to the amount of farm production and the degree of household food security. While the amount of farm production affects the decision to participate positively and significantly, household food security which is measured in terms of the households dependence on purchased food was found negative and significant (at 10%). The result is consistent with results obtained from the descriptive analysis and indicates that the probability for market participation as seller is high among households depending more on purchased food (i.e. those with limited own food production). This is not surprising as the major crop in the study area is coffee, a non-food cash crop. On the other hand, the farm gate price for coffee was found to be positive but insignificant in explaining differences in the amount farmers supplied. The three dummy variables incorporated in the model to test the relative effect of living in a given Wereda compared to the other three Weredas were found to be statistically insignificant. This indicates that area-based differences among the sampled farmers are not important.

Table 8: Determinants of participation and extent of participation in output market

Explanatory variables	Market entry/participation		Extent of market participation (Value of output sold)	
	Coefficient	z-statistics	Coefficient	t-statistics
Value of output produced[16]	0.016	2.59**	0.843	2.81***
Farm gate price (lagged)			0.637	0.18
Household food security (Proportion of purchased food)	-0.013	1.61*	-60.161	1.97**
Per capita non-farm income	0.007	0.14	0.234	0.96
Proportion of non-farm income	45.693	0.27	391.81	0.06
Specialisation in coffee production	0.014	0.92	5.38	0.18*
Aleta Wondo Wereda dummy	-32.79	16.85	-383.74	0.91
Ghimbi Wereda dummy	-33.98	22.42	662.84	2.12**
Gomma Wereda dummy	-33.93	23.33	291.24	0.09
Constant	0.16	0.18	0.43	0.14
No. of observations		120		105
Log likelihood		-28.0231		
Pseudo R-square		0.2859		
R-square				0.67

[16] We estimated determinants of output using a Cobb-Douglas production function as total value of farm output is found significant in influencing farmers' decision on market participation. Model estimates (results not reported here) indicate the positive impact of farm size and total labour input per hectare of land. Other factors like age and sex of household head and use of purchased inputs were not found significant to explain household-level differences in total value of farm outputs.

On the other hand, regression result on supply decision among farmers participating in markets indicate that supply increases with the value of output produced and the degree of households specialisation in coffee production. Similar to the case of market entry (decision to participate), household food security is found negative and significant in affecting supply decision. The propensity to supply more is significantly higher among households depending more on purchased food. Except for the degree of specialisation, the determinants of market participation and the degree of commercialisation (as indicated by differences in the amount of supply) do not appear to differ substantially.

6. Conclusions and implications

In this paper, we have applied logit and OLS regression models to assess what determines the likelihood and the extent of market participation among smallholders in major coffee growing areas of Ethiopia. The value of total farm output appears crucial both for agricultural market expansion (in terms of increasing the number of sellers) and the extent of participation, i.e. amount sold per household. Substantial supply response could be attained if barriers for production expansion (both technological and resource-related constraints) can be overcome. On the other hand, households depending only to a limited degree on purchased food (which implies a small amount of coffee in the cropping mix) have a low degree of market participation.

Descriptive statistics show that coffee is the major source of cash income and employment for smallholders in the study areas. Coffee production also has a multiplier effect that could lead to increased demand for food and services in the local economy leading to higher levels of monetisation of the local economy and its better integration into the wider economy.

However, the process of commercialisation involving non-food cash crops carries substantial risks for smallholder farmers, in relation to the market and prices of both cash crops and staple food crops. As witnessed recently in Ethiopia, the capacity of small coffee growers to withstand the adverse effect of a drastic decline in international coffee price is limited. Coffee price declines have an immediate effect on their livelihood through the shortage of cash income or savings to buy fertilisers (mainly used for food crops), clothes, medicines or food. Because of a lack of institutional arrangements to insure against risks associated with coffee price fluctuations or unreliable food marketing system, small-scale coffee growers in the study areas usually follow a diversified production pattern. Even in the studied Weredas, where agro-ecological factors are highly favourable for the production of the best quality coffee, growers usually do not allocate more than 60% of their total

land to coffee. The strategy of diversification might have supported and insured smallholder coffee growers against unexpected falls in world coffee price. However, this benefit is not without its cost. Coffee growers forego income that might accrue to them if they shifted their crop mix more towards coffee, a comparatively high value crop.

The emerging picture indicates the benefits of attempting to address the risks and market failure aspects necessary to make increased coffee-led agricultural commercialisation a viable pathway for agricultural development in coffee growing areas of Ethiopia. The following policy implications are derived from the findings discussed above.

Policy implications

(i) As the propensity to supply more is significantly higher among households having a higher dependency on purchased food, minimising the trade-offs in the production of coffee and staple food crops, especially in the short-term, is very important. To improve the complementarity of coffee and other crops, the productivity of food crops needs to be increased first; secondly, risks associated with specialisation in coffee and unreliable food markets need to be minimised. It may also need interventions in the coffee market towards managing high price fluctuations and developing institutional mechanisms (like insurance) that can help coffee growers to better deal with market risks.

(ii) In the longer run and once food markets are better developed, stronger policy attention is needed towards supporting farmers to achieve a higher degree of specialisation in coffee. It is also important to improve the current coffee yield, which is very low in comparison to international levels. Improved productivity is expected to lead to higher levels of specialisation in suitable coffee growing areas.

(iii) Support towards developing the non-farm sector should be strengthened, as there is structural under-employment in coffee growing areas and substantial employment generation via increased coffee commercialisation cannot be expected.

Implications for further research

In general, the case study presented in this paper indicates the benefits of further smallholder commercialisation in coffee growing areas and thus provide support for the current government policy aiming at increased smallholder commercialisation and support of the agricultural export sector. However, it also shows the existence of

major limits to further commercialisation at household level associated with expanding production and increasing specialisation in coffee production. One hypothesis emerging from the quantitative analysis is that limitations to further commercialisation are linked to the structure of the food crop market. Findings from the qualitative field work support this hypothesis, as farmers repeatedly pointed out that risks related to high levels of commercialisation and specialisation are too high to abandon a diversified farming system. Not enough, however, is known about the relationship between markets for food and cash crops and how they influence the investment decisions of smallholder farmers in coffee growing areas.

Increasing open and disguised unemployment rates are a characteristic of many rural areas. More research into effects of commercialisation on employment and potential production-related barriers to further commercialisation seems appropriate.

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