

HARARGHE FARMERS ON THE CROSS-ROADS BETWEEN SUBSISTENCE & CASH ECONOMY

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I. Introduction

1.1 Study aims & methodology

The Hararghe highlands are situated in the eastern part of Ethiopia, circumscribed by East & West Hararghe Zones, part of the Oromyia National Regional State. As will be described hereafter, the area is known for its cash crop production and food crop deficit.

The main aims of the study are to reveal the recent trends of cash crop versus staple food production and to identify its impact on the rural economy in general and on food security in particular, based on the presumption that cash crop production is gaining on importance at the expense of food crops.

This report is based on information gathered during several field trips including a field survey, as well as from the study of relevant documents in Addis Ababa. The field trips, including a previous monitoring mission, allowed the writer a limited view of 15 *anaas* (weredas) and the opportunity to consult the library of the Alamaya University of Agriculture. The field survey was conducted in the three *anaas* of Deder, Kombolcha and Habro, where discussions were held with groups of farmers according to their specific farm management, based on a detailed checklist.

We want to express our gratitude to the farmers for their frank and open contribution, to the zonal and communal offices of agriculture for their helpful collaboration, to the relevant staff of the Alamaya University of Agriculture for their effort to provide relevant documentation and to all other persons who shared their knowledge with the producer of this report.

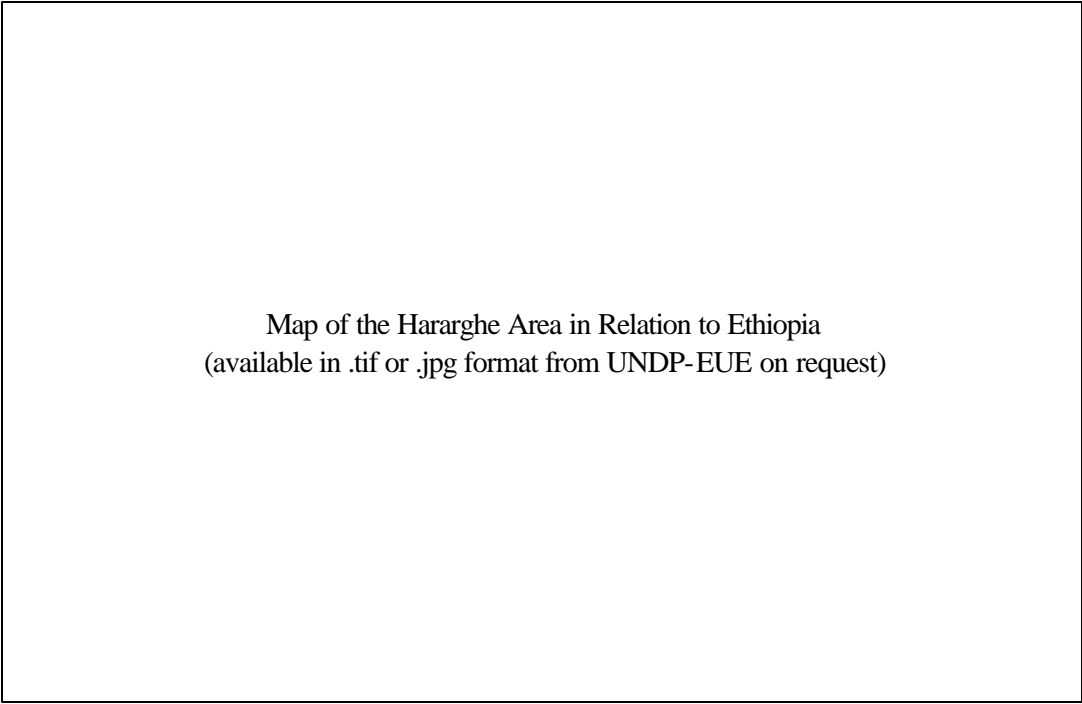
The interpretation of findings, the conclusions and recommendations express the view of the writer of this report and do not imply the expression of any opinion on behalf of people having contributed to the collection of data.

1.2 General description of the area

1.2.1 Geographical conditions

The Hararghe area is situated in the eastern part of Ethiopia, 200 to 400 kms east of the capital city Addis Ababa, some 300 kms south of Djibouti and 250 kms west of Hargeisa towns. In the sub-regional context (Djibouti, Northwest Somalia, & East Ethiopia) Hararghe is the only highland area with adequate climatic conditions for rainfed agriculture and a reasonably well developed transportation network by road, rail and air. Hararghe thus enjoys a privileged position for cash crop production and marketing, with the trading potential still exceeding the actual production capacity.

The road sector development program foresees the upgrading of the gravel trunk road going from Awash to Kulubi with an asphalt concrete overlay and the rehabilitation of the Harar-Dengego & Kulubi-Dire Dawa roads from asphalt surface dressing to asphalt concrete overlay. The program might extend its rehabilitation works on link roads leading to wereda main towns, especially for roads under the responsibility of the Ethiopian Road Authority like the Arba Reketi/Darolebu road.



Map of the Hararghe Area in Relation to Ethiopia
(available in .tif or .jpg format from UNDP-EUE on request)

The agroclimatic range includes lowland (*kolla*, 30-40%), midland (*weyna dega*, 35-45%) and highland areas (*dega*, 15-20%), with lowest elevations at around 1,000 m asl, culminating at 3,405 m, at the top of Gara Muleta mountain. There are two rainy seasons, the small *belg* and the main *meher*. *Belg* production is limited within the *dega* zone and part of the wetter *weyna dega*, but *belg* rains are widely used for land preparation and seeding of long cycle *meher* crops (sorghum & maize). Annual rainfall averages range from below 700 mm for the lower *kolla* to nearly 1,200 mm for the higher elevations of *weyna dega* & *dega* zones. The variability of rainfall from year to year

and its often uneven distribution during the growing seasons give place to a wide range of climatic hazards which farmers have to deal with.

The main staple food includes sorghum and maize, as well as sweet potato, which is extensively cultivated during bad years to improve food security. Other food crops include barley, wheat, teff and pulses. Cash crops like *chat* (a popular, mild narcotic) and coffee have a long standing tradition, complemented by Irish potatoes, onions/shallots and some other vegetables. They are mainly cultivated in the *weyna dega* zone, with some extension into the lower *dega* and exceptionally into *kolla* (*chat*). The eastern lowlands (Babile, Gursum) and to some extent the southern lowlands grow groundnuts as a cash crop. Some twenty years ago, the lowlands of Mieso produced sesame, but meanwhile cultivation has stopped for climatic (& eventually economic) reasons, even so sesame is more tolerant to aridity than groundnuts.

Climatic hazards are increasingly frequent in Hararghe, with pest infestations and crop diseases additionally hampering crop production. Coupled with high land pressure, the margin of farmers for agro-economic decisions is progressively narrowing.

1.2.2 Population & livelihood

The overwhelming majority of the people are rural, with only 6% of urban population for the two zones. This figure might be slightly misleading, as the two major towns bordering or enclosed within Hararghe, Dire Dawa and Harar, are not part of the administrative circumscription.

The urban population is mainly active in the service sector, as members of public services and administration, or in trade and hostelry, with a small manufacturing component. The vast majority of rural population is living from agriculture, with some pastoralists and/or agropastoralists in the lowland areas.

The estimated population breakdown for 1998 per *aanaa* (wereda) and zone, as well as the population density is listed in Table I.

1.2.3 Development trends & impact

Increasing population density coupled with the lack of alternative employment opportunities leads to progressive land pressure and subsequent shrinking of individual landholdings. Likewise, arable land has to be used intensively, leaving practically no room for fallowing, as can be clearly seen in Table II. Under actual conditions, crop rotation and fallow is no longer practised through managerial decisions based on agricultural techniques, but dictated by climatic hazards. During a bad year, fallow will increase, especially in the lowlands, whereas the crops to be planted on individual plots will have to be chosen according to moisture availability and expected length of growing period. In this context, short cycle crops increasingly gain on importance.

Table I: Population Breakdown: 1998 Estimation*

Zone	Aanaa (Wereda)	Rural Population	Urban Population	Total Population	Pop. Density		
W-Hararghe	Guba Koricha/Anchar	152'245	4'423	156'668			
	Mieso	82'724	22'738	105'462			
	Chiro	307'774	23'458	331'232			
	Doba	102'326	1'225	103'551			
	Total Area	119'495	12'497	131'992			
	Mesela	121'798	3'671	125'469	?		
	?	Kuni	115'894	12'170	128'064		
	Habro	122'808	16'963	139'771			
	Boke	81'983	2'352	84'335			
	Darolebu	116'586	8'400	124'986			
Subtotal	West Hararghe	1'323'633	93%	107'897	1'431'530		
	Number of Households	275'756		25'092	300'848	(4.8/4.3)	
E-Hararghe	Gorogutu	114'111	4'877	118'988			
	Deder	186'220	15'855	202'075			
	Meta	186'660	7'831	194'491			
	Kersa	128'740	7'668	136'408			
	Kurfa Chele	40'298	3'101	43'399			
	Alemaya	166'592	20'914	187'506			
	Total Area	Kombolcha	87'013	6'180	93'193		
	Jarso	98'678	1'954	100'632	?		
	?	Gursum	160'664	9'744	170'408		
	Babile	46'156	10'349	56'505			
	Fedis	166'190	2'921	169'111			
	Grawa	196'821	4'885	201'706			
	Bedeno	192'402	5'020	197'422			
	Melka Balo	132'044	6'486	138'530			
	Gola Oda/Meyu Muluke	47'489	2'529	50'018			
	Subtotal	East Hararghe	1'950'078	95%	110'314	2'060'392	
		Number of Households	414'910		25'654	440'564	(4.7/4.3)
	Total		3'273'711	94%	218'211	3'491'922	
		Number of Households	690'666		50'746	741'412	

* based on 1994 census, readjusted by an annual growth rate of 3%

Table II: Estimate of Area under Different Land Use by Size of Individual Landholdings (1994/95)*

Type of Land Use	Size of Individual Landholdings & Area Coverage										Total ha	
	<0.10 - 0.50 ha		0.50 - 1.00 ha		1.00 - 2.00 ha		2.00 - 5.00 ha		5.00 - 10.00 ha		ha	%
West Hararghe	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
- Annual Crops	26'330	77%	41'290	79%	43'530	83%	21'020	83%	6'980	99%	139'150	81%
- Perennials	5'890	17%	7'360	14%	6'770	13%	3'590	14%	-	-	23'610	14%
- Grazing Land	130	-	780	2%	280	1%	430	2%	-	-	1'620	1%
- Fallow Land	90	-	710	1%	590	1%	-	-	-	-	1'390	1%
- Wood Land	-	-	-	-	-	-	-	-	-	-	-	-
- Other Land Use	2'010	6	2'120	4%	1'090	2%	260	1%	50	1%	5'530	3%
Total	34'450	100%	52'260	100%	52'260	100%	25'300	100%	7'030	100%	171'300	100%
%/Size of Landh.	20.1%		30.5%		30.5%		14.8%		4.1%		100%	
East Hararghe												
- Annual Crops	38'720	73%	70'620	80%	50'370	82%	9'430	79%	-	-	169'140	79%
- Perennials	5'860	11%	7'920	9%	5'560	9%	1'020	9%	-	-	20'360	9%
- Grazing Land	780	2%	2'000	2%	1'410	2%	640	5%	-	-	4'830	2%
- Fallow Land	2'670	5%	2'830	3%	2'030	3%	580	5%	-	-	8'110	4%
- Wood Land	-	-	-	-	30	-	-	-	-	-	30	-
- Other Land Use	4'800	9%	4'770	6%	2'180	4%	220	2%	-	-	11'970	6%
Total	52'830	100%	88'140	100%	61'580	100%	11'890	100%	-	-	214'440	100%
							0					

%/Size of Landh.	24.6%	41.1%	28.7%	5.6%		100%
E & W	87'280	140'40	113'84	37'19	7'030	385'740
Hararghe		0	0	0		
%/Size of Landh.	22.6%	36.4%	29.5%	9.7%	1.8%	100%

* Adapted from Tables of the Central Statistical Authority

The impact of land availability and distribution for individual farmers is shown in the following table. Choosing an estimated average size of landholding for each category, considering small landholdings (< 0.1-0.5 ha) above and bigger farms (> 2 ha) below average, we obtain the following approximate values of number of farms per average size of individual landholdings, which correspond to a possibly more realistic average rural household size of around 6.5 people, as compared to the 1994 census (W-H 4.8, E-H 4.7 persons/HH).

Table III: Average Size of landholdings

Area	Average Size of Individual Landholdings						Total
	0.4 ha	0.75 ha	1.5 ha	3 ha	6 ha		
West Hararghe							
- Area Coverage	34'450 ha	52'260 ha	52'260 ha	25'300 ha	7'030 ha		171'300 ha
- Number of Farms	86'125 43%	69'680 35%	34'84 17%	8'433 4%	1'172 1%		200'250 100%
East Hararghe							
- Area Coverage	52'830 ha	88'140 ha	61'580 ha	11'890 ha	-		214'440 ha
- Number of Farms	132'075 45%	117'520 40%	41'05 14%	3'963 1%	-		294'611 100%
E & W Hararghe							
- Area Coverage	87'280 ha	140'400 ha	113'840 ha	37'190 ha	7'030 ha		385'740 ha
- Number of Farms	218'200 44%	187'200 38%	75'89 15%	12'39 3%	1'172 -		494'861 100%

According to the available data we obtain the result of 44% of farmers with landholdings not exceeding 0.5 ha and 82% of farmers with landholdings ≤ 1 ha. Even if the accuracy of available data is questionable, they nevertheless reveal the actual trend where farmers main capital besides labour, the arable land, is reaching a critical stage of fragmentation. The prevalence of extreme land pressure has already resulted in vast deforestation and the cultivation of unsuitable slopes in the highlands and mid-highlands, causing severe environmental damage. In addition, considering the fact that with a population growth rate of around 3%, farm units are expected to double approximately every 20 years, future prospects in agriculture look very bleak.

The situation is complicated further by the multitude of very diverse farming systems, as practically every farmer follows his individual farm management strategy in terms of physical and human inputs, crop varieties, etc. As a common trend, especially in *weyna dega* zones, taking advantage of the specific geographical situation, farmers respond to the worsening situation by progressively increasing their cash crop production, in order to improve the performance of their farms in terms of cash value. The subsequent progressive shortage of staple food is made up by the supply of cereals originating from neighbouring surplus producing areas of Arsi, Bale and to a lesser extent East Shoa.

II. Main Cash Crops, Location & Development Trends

Main cash crops are *chat* and coffee as perennials and Irish potatoes, onions/shallots and other vegetables as annuals. They are grown within their respective agroclimatic zones, with a concentration on irrigable plots for vegetables and *chat*. *Chat* as a very perishable commodity can only be cultivated close to good roads and not too far from the main markets or airport. Its cultivation is therefore concentrated along the main road from Chiro *aanaa* up to Harar and Dire

Dawa and in neighbouring areas with good link roads, like Habro and Kuni for West Hararghe and Deder, Kombolcha and Gursum for East Hararghe. Vegetables grown in Hararghe, being generally less perishable, enjoy a wider geographical market, with local concentrations according to climate or irrigation possibility and soil fertility. Coffee as a non-perishable commodity is grown within its agroclimatic zone nearly all over Hararghe, with a net concentration in remote areas with bad or no road access. In the eastern lowlands (Babile, Gursum) groundnuts are a common cash crop.

In general, the development trend for cash crops over the last decade is clearly positive, with *chat* being the leading crop, followed by Irish potatoes, onion/shallots & other vegetables; whereas coffee generally marks a very low development trend except for three *anaas* in West Hararghe, while being the only cash crop showing some localised negative trends.

All farmers asked about their planned strategies for the future responded that they intend to increase their cash crop production. Farmers living in remote areas with difficult access are mainly interested in coffee, especially if Coffee Berry Disease can be controlled, whereas better located farmers foresee an expansion of their *chat* plantations. While the actual farming systems are still characterised by a strong subsistence component, the continuous trend in favour of cash crop production will soon bring the Hararghe farmers to the cross-roads between a subsistence and cash economy.

Table IV shows the breakdown of main cash crops for each *anaa* according to their local importance, the specific cultivation methods, the development trends over the last decade and the percentage of farms cultivating them. They are based on estimations done by the zonal departments of agriculture.

III. Crop Description

3.1 Coffea arabica

All cultivated coffee species originate from Africa, the most appreciated for its quality, *coffea arabica*, from Ethiopia. The plant has meanwhile been propagated to other African countries and to overseas. The bulk of arabica coffee is produced on the American continent. Collection of wild coffee followed by the cultivation of coffee plants has a long tradition in Ethiopia and coffee was already exported to Arabic countries in the 15th century. Ethiopia is also the only African country with a long-standing coffee drinking tradition, well embedded in the everyday life.

In Hararghe coffee is generally grown at altitudes ranging from around 1,700m to 2,000m asl, the lower limit being determined by the average amount of rainfall ($\geq 1,000$ mm) and distribution and the higher by the ambient temperature (best growth with average daily maximum temperatures of 24° C).

Coffea arabica is a shrub with a height not extending 5 m. Its roots penetrate the soil up to 3 m deep, with an extensive superficial fibre root system, developing on a radius of up to 1.5 m around the stem. Coffee plants need deep, well drained soils with a good capacity for moisture retention. Optimal pH-level ranges between 5.5 to 6.5.

Table IV: Main Cash Crops per Aanaa & Development Trends

East Hararghe

Aanaa	Cash Crop	Cultivation Method				Last Decade		% of Farms
		rainfed	irrigated	pure stand	intercropped	↑ Dev. Trend ↓		
Gorogutu Deder	Chat		x		xxx	x		~50%
	Chat	xxx	xxx	x	xxx	xxx		
	Coffee	xxx	x	xxx		(x)		
Meta	Potato	x	xx	x		x(x)		~65%
	Onion & Veg.	x	xx	x		x(x)		
	Chat	x	xxx		xxx	xxx		
	Potato	x	xxx	xxx		xx		
Kersa	Coffee	xxx		xxx		(x)		~60%
	Onion	x	x	xxx		x		
	Chat	xx	xx		xxx			
Kurfa Chele Alemaya	Potato	x	xx	xxx				~70%
	Other Veg.	x	xx	xxx				
	Potato	x	x	xxx				
Komboleha	Chat	(x)	xxx		xxx			~15%
	Potato	x	xxx	xxx		xxx		
Jarso	Onion & Veg.	x	xxx	xxx		xxx		~75%
	Chat	x	xxx		xxx	xxx		
Gursum	Peanut	xxx		xxx		x		~35%
	Coffee	x		xxx		x		
Babile Fedis	Peanut	xxx		xx	x	(x)		~50%
	Shallot	xxx		xxx		x		
Grawa	Coffee	xxx		xxx		x		~5%
	Banana		x	xxx			stable	
Bedeno Melka Balo	Coffee	xxx		xxx		xx		~15%
	Coffee	xxx		xxx		x		
	Chat	xx	xx		xxx	x		~20%

Ranking: xxx high xx medium x low

West Hararghe

Wereda	Cash Crop	Cultivation Method				Last Decade		% of Farms
		rainfed	irrigated	pure stand	intercropped	↑ Dev. Trend ↓		
Anchar	Coffee	xxx		xxx	(x)	x		10%
Guba	Chat	xxx	x	xx	x	xx		5%
Koricha Mieso	Onion	xxx	x	xxx		x		4%
	Chat	x	xxx	xxx		xxx		5%
Chiro	Chat	xxx	xx	xx	x	xxx		40%
	Coffee	xxx		xxx	(x)	x		20%
	Onion	x	xxx	xxx		xxx		15%
Doba	Chat	xxx	xx	xx	x	xxx		15%
	Coffee	xxx		xxx	(x)	x		15%
Tulo	Onion	xx	xx	xxx		xx		5%
	Chat	xx	xx	xx	x	xx		20%
Mesela	Coffee	xxx		xxx	(x)	x		10%
	Onion	x	xxx	xxx		xx		10%
	Coffee	xxx		xxx		xxx		65%
Kuni	Chat	xxx	xx	xx	x	xx		10%
	Pepper	xxx		xxx		xx		3%
	Coffee	xxx		xxx			xxx	45%
Habro	Chat	x	xxx	xx	x	xxx		25%
	Pepper	xxx	x	xxx		xxx		10%
	Onion	xx	xx	xxx		xxx		5%
Boke	Coffee	xxx		xxx			xx	60%
	Chat	x	xxx	xx	x	xxx		30%
	Pepper	xxx		xxx		xx		5%
Boke	Onion	xx	xx	xxx		xx		3%
	Coffee	xxx		xxx		xxx		65%
	Chat	xxx		xx	x	x		3%

Darolebu	Pepper	xx		xx		x		2%
	Coffee	xxx		xxx		xxx		75%
	Chat	xxx		xx	x	x		8%
	Pepper	xxx		xxx		x		5%
	Sugar Cane		xxx	xxx		xx		3%

Ranking: xxx high xx medium x low

In Hararghe coffee is generally grown in pure stands, with intercropping only during the young stage. It is grown mostly under rainfed conditions, sometimes improved by water conservation measures and even harvesting devices for run-off water in more arid areas. In some locations irrigation is used, especially after the main rainy season until harvest time. Coffee seedlings are mostly bought from nurseries handled by the Ministry of Agriculture (MoA), with some farmers producing their own seedlings. They are planted mainly on flat land or gentle slopes with reasonably fertile soil, in pits enriched with manure, at a distance of generally 2 by 3m under normal climatic conditions and up to 2.5 by 4 m in dryer areas. Coffee plants are mostly grown under the full sun, with shadowing only practised in few areas.

Manure is applied every year according to availability, whereas chemical fertilisers are used intermittently, whenever financially possible. Weeding and harrowing is done two to four times a year. All consulted farmers are mulching their coffee plantations with different available materials. Pruning is generally done once a year after harvest. Old trees are cut back to rejuvenate. Without fertilisation coffee plantations decrease soil fertility and once well established, have a negative effect on neighbouring crops.

As main diseases on coffee, farmers mentioned above all Coffee Berry Disease (CBD), followed by die-back and leaf rust. CBD is causing severe damage and important yield reductions every year and is probably the main factor for the decreasing interest in coffee as a cash crop. Since farmers have to cover the full costs of phytosanitary measures, few coffee producers apply them for its prohibitive costs. Actually, fungicide applications are mostly not profitable, as expenses generally exceed the benefit from higher yields. The coffee implementation project (CIP), active since 15 years covering 60% of Ethiopia's coffee producing areas, works also in three *aanaas* of West Hararghe (Kuni, Habro, Darolebu) through the MoA offices. Unlike the Jimma area, it has not yet succeeded in selecting consistently more resistant varieties adapted to the agroclimatic conditions of Hararghe. Farmers have no local remedies against coffee diseases. Main measures mentioned to avoid high infestation is to refrain from working in the coffee plot during the rainy season.

Coffee is harvested between October and January. The average yield per hectare amounts to 400-500 kg of clean beans, with big variations between years, according to climatic conditions, degree of infestation and fertiliser application, ranging from below 400 kg up to 700 kg/ha and more. Coffee producers of East Hararghe and Mesela generally process their coffee on the farm to sell clean coffee beans, whereas the coffee produced in the central and southern part of West Hararghe (Kuni, Habro, Boke, Darolebu) is sold as dried cherries, the hulling being done by the traders.

Some coffee farmers hire casual labour, generally not exceeding 50 person-days per year. The wage rate amounts to around 5 Birr per day, with additional food and *chat* furnished by the employer. Workers generally originate from the *aanaa* or neighbouring areas, with some people coming from as far as Shoa and Gojam (W-H).

Main problems with coffee production mentioned by the farmers were: high incidence of CBD, high price for imported agricultural inputs like chemical fertilisers & phytosanitary products and price fluctuations on the coffee market.

3.2 Catha edulis

Chat is a tree reaching 25 m when grown naturally, but is generally kept to 1.5-4 m when cultivated as a cash crop. *Chat* occurs naturally in East Africa at elevations between 1,500 m to 2,500 m asl. Once established it grows well under a wide range of soils and climatic conditions, having a better drought tolerance than coffee. It can be grown in dry areas with irrigation, but does not tolerate poor drainage and does not do well in wet soils. It performs best in the midlands (*weyna dega*) between 1,500 m and 2,100 m asl, but is cultivated in Hararghe into the lower *dega*, until around 2,400 m asl, if not too cold and frost free (Amare Getahun & A.D. Krikorian, 1973).

The wood of *chat* trees is suitable for cabinet work, fuel wood and appreciated for house construction as termites do not attack it, while different parts of the tree are used as local medicine. *Chat* is cultivated as a cash crop for its young leaves and tender stems chewed as a mild natural stimulant, which, like coffee or alcoholic beverages, plays an important role in the social life of people in Ethiopia in general and in Hararghe & Somali Region in particular. It is also highly appreciated in neighbouring Somalia, Djibouti and Yemen. Its use in Africa and the Arabic peninsula goes back to the 13th century (Kalix 1985).

In Hararghe *chat* is generally planted on hillsides, in rows along contour lines on level bunds (spacing in the row \pm 1m, between rows \geq 2m). On reasonably fertile soils *chat* is intercropped with maize and other food crops, whereas on steep slopes and marginal land it is grown in pure stands. Alongside with the progressive development of *chat* production, farmers add additional rows in between, finally reaching pure stands. Pure stands have been more frequently observed in West Hararghe. *Chat* is usually planted or transplanted in August by vegetative propagation from suckers or branches. Irrigation is used whenever possible, to increase the number of main harvests, the yield, the quality and the price.

All consulted farmers apply manure, generally once a year, with some farmers using also chemical fertilisers according to cash availability. Weeding and harrowing is done around three times a year. Few farmers are mulching their *chat* plantation. Aside of harvesting, pruning is done every three to four years to rejuvenate the plants. Defoliation is practised by part of the farmers, either in bad years during the dry season or to obtain best quality. *Chat* is believed to decrease soil fertility and to have some negative effects on neighbouring crops from shade, concurrence of nutrients and moisture. The widely used practise of intercropping somewhat attenuates the statement of the farmers and might mainly apply for *chat* plantations with narrow spacing between rows (\leq 2m).

Chat in Hararghe is not highly affected by pests and diseases, a situation which might slowly change for the worse with increasing density of plantations. Some fungal diseases can be observed during the rainy season, whereas insects are the main cause of damage. To control the infestations, farmers collect insects by hand, apply locally produced remedies (e.g. a mixture of crushed tobacco leaves, garlic & soap) or even spray insecticides.

Rainfed *chat* gives a maximum of two main harvests towards the end of the rainy seasons. Under irrigation three and more main harvests can be realised and eventually timed to fall into a high price period. In addition, lower quality *chat* is harvested all through the year, sold on local markets and used for home consumption. On the average *chat* yields around 700-1,000 kg per hectare.

From the consulted farmers during the field survey, only few hire casual labour for up to 30 person-days a year. The wage rate is equal to that offered by coffee producers.

Main problems with *chat* production mentioned by the farmers were: shortage of manure, high price for chemical fertiliser, lack of credit facilities and low availability of irrigation possibilities.

3.3 Comparative advantages of coffee & chat

Table V: Comparing Coffee and Chat Cultivation

Criteria	Coffee	Chat
Agroclimatic range (without irrigation)	moist & wet weyna dega 1'700-2'000m ≥ 1'000 mm	lower dega, dry to wet weyna dega, moist higher kolla: 1'400m - 2'500m optimal 1'500m - 2'100m
Soil conditions	well drained, deep & fertile	high range of soils, but well drained
Drought tolerance	moderate to good (in deep & fertile soils)	high
Establishment	3-6 years (first harvest/full establ.)	3-5 years
Cultivation area	according to agroclimatic range	only near to at least good secondary roads & not too far from markets & airports (except for local cons.)
Production/management Agroforestry use	complex not adapted for its extensive superficial fibre root system	easy well adapted
Vulnerability to pests & diseases	high, especially for CBD	low; in the case of leaf hopper infest., damage produces expensive quality
Harvest	1 time per year, generally low due to CBD, soil fertility, management	2 (rainfed) to 5 times/year (irrigated) plus regular harvest for local market
Storage possibilities	for a long period	none
Price	good, but depending on fluctuating world market	medium to high, according to quality, fluctuating, high tax charges
Income	medium	high

3.4 Irish potato

Irish potato is an annual root crop with a vegetative cycle of around four months. It is mainly grown in higher *weyna dega* and lower *dega*. Often cultivated in pure stand, it can also be found intercropped with *chat* (*dega*) or vegetables (irrigated). It is generally planted in April & July for rainfed and in October & December for irrigated plots.

Recommended plant density by the Alemaya University of Agriculture (AUA) amounts to 48,000 plants or 1,500 to 2,000 kg of seedlings per hectare. As potato seedlings have a short storage time,

they are usually purchased or multiplied during the first cropping season. Even though farmers often use a lower plant density than recommended, the purchase of seedlings represents a high investment and share cropping is common.

Potato plots are tilled and weeded around four times. Its cultivation is labour intensive, with an average of 1,000 to 1,500 hours per hectare (Storck 1997). Different diseases, especially late blight, are common and can seriously affect the yield. Farmers therefore often prefer the dryer *belg* season for cultivation with lower incidence of diseases. The AUA has selected a more resistant variety, but the amount of seedlings available is too little to satisfy the needs. In the average potato plots yield around 5-7 MT/ha under rainfed conditions. With irrigation it can easily double or even triple, especially with good management and adequate fertilisation.

High yield and calories production during a short growing cycle make potato an interesting food and cash crop. High expenses for seeds and chemical fertiliser, the risk of failure due to climatic hazards and diseases and the shortage of improved seeds resistant to the common diseases are the limiting factors for its successful production (Berhanu Adenew, Harmen Storck, 1992).

3.5 Onion & shallots

Onion and shallots are annual vegetables grown in *weyna dega* and lower *dega* under rainfed conditions and with irrigation. They are generally cultivated in pure stands. Planting periods are similar to Irish potato and when rainfed, farmers prefer the dryer *belg* season to lower the incidence of diseases. It is one of the most important commercial vegetable crops on the national market as well as for export.

The recommended planting rate amounts to 1,000 kg of bulbs per hectare. Like potatoes, the planting material is usually purchased and represents a considerable investment. The MoA disposes of some onion seeds, but farmers prefer the local varieties and bulb planting.

The cultivation of onion/shallots is even more labour intensive than that of potatoes, with an average of 1,300 to over 2,600 hours per hectare. Yields vary a lot and can be considered in the range between 3.5 to 9 MT per hectare. The not marketable yield, representing some 20%, will be used as planting material, for home consumption and for sell on the local market. Being an important ingredient for the Ethiopian kitchen, onion and shallots have a good marketing potential within the country and are less dependent on export trade, even if the price level might be lower.

3.6 Others

There are several other crops cultivated as cash crops or for dual purpose like pepper, various vegetables, groundnuts, sugar cane, fruits, etc., which are sold on the local or national markets or exported to neighbouring countries. For this survey we are limiting our observations to the four main cash crops, listed above.

IV. Marketing Possibilities & Practise

Coffee: Farmers sell their coffee directly to coffee merchants, who are generally established within the coffee producing *anaas*. The coffee is either brought by the farmer or collected by the merchant. All coffee goes through dry processing. After harvest the coffee cherries get sun dried and then hulled, either by hand or with a huller. Coffee producers of East Hararghe and Mesela are selling the clean beans, whereas those of Kuni, Habro, Boke and Darolebu sell the dried cherries, the hulling being done by the merchants.

The producer price for clean beans varies from 12 to 16 Birr per kilo, while dried cherries fetch from 4.50 to 6 Birr per kilo. Farmers usually sell 80% to over 90% of their production, whereas the remaining is kept for home consumption. As the coffee price is generally lowest after harvest, farmers will store their production awaiting a better price, whenever they can afford it. The dried pericarp recuperated after hulling is also sold, fetching around 13 Birr per quintal. It is used to make a coffee-like beverage.

No marketing problems have been mentioned by the farmers. But, while farmers acknowledge the increment of the producer price for coffee, they compare it to the actual production and living costs which have equally risen, the lack of credit facilities, etc., to conclude that in the end, their financial situation has not changed much.

The Hararghe coffee is auctioned in Dire Dawa and exported through Djibouti, mainly to Arabic countries and Japan. While the coffee produced in East Hararghe and Mesela is highly quoted, the one from the other *anaas* fetches a lower price or is even rejected by the exporters. According to coffee merchants, the good quality coffee is actually paid 17.35 Birr per kilo at the Dire Dawa export market since the past four months. Merchants have to pay a tax at *anaa* level, which reportedly amounts to 5,000 Birr per truck load of 120 quintals.

Mesela in the West and Bedeno in the East Hararghe zone are well known for high quality coffee. There is also the yellow bean coffee, considered to be of highest quality, which is not area specific but occurring at localised places, supposed to have specific soil conditions.

Chat: Being a very perishable commodity which has to reach the consumer within two days, chat requires a sophisticated marketing system with a well functioning transportation network, especially when final destinations are as far as Djibouti & Aden (by air from Dire Dawa) and Hargeisa, Berbera & Boosaaso (by air from Hargeisa). *Chat* from Hararghe has known an ever growing export market. In 1948 exports amounted to 200 MT, in 1957 it reached already 1,400 MT. The current annual tonnage exported could not be determined, but with one single *chat* trader exporting by himself an average of 1,000 MT per year, one can imagine to what extent the trade has expanded.

Chat is generally harvested early in the morning or towards the evening and transported to the trader or the road side, where it gets collected. In some areas like Habro and Kuni, traders directly negotiate with the producer the crop of a plot, which then gets harvested by workers hired by the

trader. *Chat* is either bought directly or through a broker, whose cost may be paid by the trader or the producer, depending on the area. Some traders purchase, process and export *chat* by themselves, others buy and transport it to a processing centre like Awadaye, who is the most important.

The main harvest of high quality *chat* is usually marketed by the head of household, while the *chat* sold for local consumption is handled by women. To facilitate the access to the production area, farmers usually contribute their labour to maintain the feeder roads. For the maintenance of the link road leading from Arba Reketi to Habro and Darolebu, farmers had reportedly to contribute 3 Birr each for grader work.

Generally over 90% of production is sold, the rest being used for home consumption. During the survey the producer price for export quality *chat* ranged from 20 to 50 Birr per kilo, with an average price of around 30 Birr. Farmers complained that prices have dropped considerably due to the imposed tax increase, which, paid by the trader, is finally weighing on the producer price. Traders confirmed the phenomena, adding, as additional reason for the price drop, the low purchasing power of consumers, provoked by the ban on livestock sales originating from Somalia, Ethiopia and Kenya. A *chat* trader, exporting to Hargeisa, listed the different tax loads as follows: At *aanaa* level 0.20/kg, Awodaye 5.60/kg (finance), Harar Region 0.20/kg, Jijiga 3.50 plus 0.20/kg, Togochale 0.50/kg, totalling over 10 Birr per kilo of *chat* from the producer area to the Somali border. There is virtually no other agricultural product fetching as high a tax income as *chat*.

Chat prices fluctuate also seasonally according to the amount of supply on the market. As the harvest of rainfed *chat* cannot be timed according to market trends and supply, the peak yield from *chat* farms of a same area will fall into the same period, provoking a high concurrence. Only the *chat* farmers having access to irrigation and eventually practising defoliation, can profit from top prices.

Main problems with marketing of *chat* mentioned by farmers are: the perishable character of product not allowing storage, the recent tax increase lowering producer prices and in some cases, the low number of traders resulting in imposed prices.

Irish potatoes, onion & shallots: Onion & shallots and to a lesser extent potatoes have an important inland market, as well as a high export potential. Moderately perishable, the products are generally sold quite soon after harvest, leaving little margin to fetch better prices. They are either sold directly to traders or temporarily stored by local merchants. Producer prices fetched reportedly 1.50 Birr per kilo of potatoes and around 3 Birr per kilo of onion. Retail prices in Harar amounted to 2 & 5 Birr per kilo of potatoes and onion respectively.

V. Impact of Cash Crop Production on Rural Household Economy & Food Security

5.1 Farm size & subsistence

Land, labour and livestock are the main productive assets of the Ethiopian farmers. Likewise other highland areas in Ethiopia, the absorption of the major part of population growth within the

agricultural sector leads also in Hararghe to progressive land pressure and ever shrinking landholdings. Due to the scarcity of pasture land, livestock is partly fed on crop residues, the production of which is gradually decreasing according to farm size, lowering the margin for livestock production. Reduced manure application on crops and less animal products for sell further decrease the overall farm income, accentuating the vicious circle of impoverishment.

Over the years, Hararghe farmers have developed different strategies to counter the worsening situation, by making intensive use of available household labour for on- and off-farm activities and by intensifying their cash crop production whenever possible. A study, focusing on the minimum size of smallholder farms in the Hararghe highlands, based on data collected from a baseline survey during 1986/87, came already to the conclusion that the majority of the small farmers do not possess enough land even to cover their minimum subsistence, not to talk about some necessary additional minimum capital to invest in farm inputs, in order to increase the farm income generating capacity over time (Berhanu Adenew & Harmen Storck). The study came to the conclusion that "the shortage of cultivable land is becoming more and more severe in the face of an ever increasing population in the highland and the land resource tends to fail to support the farming community even under very poor living conditions". To reverse the tendency, the authors recommended to improve land and livestock productivity by introduction of feasible innovations and other means and to create off-farm and non-farm employment opportunities for the farm families in order to reduce their dependence on land.

5.2 Income possibilities from staple food & major cash crops

Table VI gives an overview of income possibilities from the main cereals and cash crops grown under rainfed conditions. It indicates the importance of respective production costs and main risk factors. It should be understood that with risk factors high for climatic hazards and/or pest and diseases, the overall risk taking increases considerably with high production costs. On the other hand, risks are much lower for crops cultivated under irrigation, alongside with a higher yield expectation (especially for Irish potatoes) and better producer prices.

Table VI: Comparison of Food Crop and Cash Crop Income Opportunities

Subject	Food Crops			Cash Crops		
	Sorghum	Maize	Coffee	Chat	Potato	Onion
Ø yield/ ha (rainfed)	700-1'200 kg	1'000-1'300 kg	400-700 kg	700-1'000 kg	5'000-7'000 kg	3'500-8'000 kg
Ø price/ kg	0.80 - 1.50	0.70 - 1.40	12 - 16.-	¼ 30.- ¼ 2.-	1.50	80% 3.- 20% 1.-
Ø gross income/ha	560 - 1'800	700 - 1'820	4'800 - 11'200	16'100 - 23'000	7'500 - 10'500	9'100 - 20'800
Production costs	low	low	low-high	low	high	high
Average net income	low	low	medium	high	medium	medium-high
Risk factor: - climatic hazard	medium	medium-high	low-medium	low	high	high
- pest & diseases	low-medium	low-medium	high	low	high	medium-high

Even if less significant cereals like barley and wheat, mainly grown in the *dega* agro-climatic zone, might give a slightly better income per hectare than the more prevalent cereals, farmers obtain a much higher productivity in terms of cash value from cash crops as compared to cereals. While keeping a strong attachment to subsistence farming by producing as much as possible their own food crops, the ever growing land pressure forces farmers to cultivate more and more of their arable land with cash crops in order to subsist or eventually realise some growth.

The development trend over the last decade (as shown in chapter II), the actual trend and planned strategies of farmers become quite obvious and understandable by comparing the income possibilities from different crops. Likewise, it is only logical that *chat* has become the leading crop, not only for its high cash return and stable income, but equally for its hardiness and plasticity to grow under a wide range of soils and climatic conditions, its low production costs and little risk.

By adapting to the specific geographical situation and marketing potential, Hararghe's cash crop producing farmers could maintain or even improve their income level over time, even so price fluctuations and ever increasing tax loads moderate their potential income possibilities. The number of farm houses covered with corrugated iron sheets is the most visible but probably not the most significant sign of high cash flow and a certain moderate wealth within the rural community of Hararghe as compared to areas with mere subsistence farming. Mixed farming systems and commercial farming result in higher food security than subsistence farming as long as the trading potential for cash crops is not exhausted, producer prices remain on an acceptable level and local market supplies with main staple food are assured.

5.3 Local staple food production: Actual trend & future impact

Hararghe has been known for many years as a cereal deficit production area. Increasing incidence of climatic hazards and progressive land use for cash crops amplify the negative trend. But Hararghe's markets have a sufficient supply of main staple foods, originating from neighbouring surplus producing areas like Arsi, Bale and to some extent East Shoa. Trading of cereals is a good income opportunity for small traders; larger traders being involved in the cash crop trade. Even when cereal prices double in response to high demand during stress periods, prices per quintal generally remain below 200 Birr. Farmers in all survey areas confirmed that staple food is always available on local markets, but with seasonal price fluctuations as mentioned before. While farmers generally prefer to consume their own products, some part of cereal production in Hararghe is also marketed, especially from the lowlands (e.g. Mieso is known for its sorghum production) and to some extent from highland areas.

Projecting actual trends, farmers of the midland and, to a lesser extent, highland areas will soon pass from a mixed cropping system to a cash economy with very low cereal production. Surplus production from neighbouring areas might then no longer suffice to fill the cereal gap of Hararghe and commercial importation of low priced food crops would become necessary.

VI Cash Crop Economy & its Impact on Rural Life

6.1 General

Cash crop economy is widespread in the *weyna dega* agroclimatic zone with most farmers having adopted a mixed farming system, using a progressively increasing part of their arable land for the production of one or several cash crops. It is followed by the *dega* or highland zone, where part of the farmers produce cash crops like potatoes, onion/shallots and in the lower parts *chat*. Subsistence farming is still predominant and cash crops are generally grown for complementary income. In the lowland zone we soon reach the limit for rainfed agriculture (≥ 700 mm rainfall per year) and even in areas with somewhat acceptable average rainfall, climatic hazards become more frequent than in the highlands. Areas with higher rainfall are mainly used for agriculture, with landholdings generally exceeding those of highland areas (\varnothing 1.5-2 ha), but with lower average yields and a growing importance of livestock production. Under rainfed conditions cash crop production is usually limited to groundnuts and some *chat* for local consumption. The lower, more arid parts of the *kolla* area are extensively used for livestock production with only some marginal cropping activities.

Based on a rough estimation one can assume that some 50% of the rural population of Hararghe is directly involved in the cash crop economy and an other 10% on a complementary base.

6.2 Local labour market & other complementary income possibilities

The limited number of farmers interviewed in various localities during the survey does not allow an interpolation of data. In order to give a general impression on the possible extent of actual employment generation through cash crop production, a rough estimation is given hereafter. Based on the assumption that one third to half of the main cash crop producers would employ an average of 40 person-days per year, one obtains 3.2 to 4.8 million person-days per year or the equivalent of a 1 month ration of cereals for 80,000 to 120,000 households (between 17% to nearly 25% of rural HH). While these figures have to be considered with caution, they still indicate a certain potential of income generating possibilities for vulnerable households, exceeding by far the possibilities existing in areas with mere subsistence farming.

Other job opportunities for daily labour can be found in the main rural towns, especially for *chat* processing, temporary jobs for loading/unloading of goods, etc. Several other income possibilities exist like the transport by donkey of farm products to the road side or local marketing centre (coffee, *chat*), the selling of hey for *chat* packing, and many other activities common to rural areas of Ethiopia like small trade, selling of wood, charcoal, grass, sisal products, etc.

The cash crop economy with its important cash flow offers a wider range of off-farm income possibilities as compared to subsistence farming areas, having a positive impact on vulnerable households by improving their capacity to cope with averse situations. But job opportunities and possibilities for self-employment created by the cash crop economy are by large insufficient to have any effect on the urgently needed decongestion of the agricultural sector. While cash crop producing farmers could positively adjust to the worsening situation of fragmented, and shrinking, landholdings,

they are well aware of the fact that their coping strategy of progressively increasing cash crop production is limited in time and space. Asked about the future prospects of the young generation, most farmers responded that their children would have to find alternative employment (non-farm employment) and emphasised the importance of formal education as a means to enter alternative professions.

6.3 Rural & semi-urban infrastructure and public services

One could assume that high cash flow and important tax revenues over a long period of time would induce growth and development to the benefit of the overall population of the Hararghe zones. While the main trading tracks are generally in acceptable condition and further improvements are planned or ongoing, other basic infrastructure and public services are much like any other rural area in Ethiopia. While merchants and traders usually prefer investing their money in big towns rather than in rural areas, tax income seems to still lack the effect of decentralisation, which would enable the inhabitants to influence the nature of investments to be realised in their respective circumscription.

These facts raise some basic questions on how and when development starts and what are the preconditions and impulses needed to induce development.

IX. Conclusions & Recommendations

Progressive intensification of cash crop production is the main strategy used by farmers of the Hararghe midland and parts of the highland areas. Making optimal use of the particular geographical conditions of Hararghe, a substantial part of rural population has managed to cope successfully with the major challenges of the agricultural sector and to break the vicious circle of impoverishment. Many cash crop producers are able to overcome a bad year by their own means without external assistance.

The leading crop, allowing part of the rural population to reach not only food security, but to overcome mere subsistence and eventually induce some growth, is *chat*. While Hararghe farmers will always produce *chat*, be it only for local consumption, they are flexible in the choice of cash crops, adapting their farm management according to changing marketing situations, income possibilities and risk factors. From the agricultural, ecological and economical point of view, *chat* is the only agroforestry plant perfectly well adapted to the needs of farmers in this region. Its hardiness, plasticity and drought tolerance fit to the predominant agroclimatic conditions of Hararghe's midland and lower highland areas. Its low impact on neighbouring crops in combination with the widely used cultivation practise (alley cropping along contour lines on soil bunds) make it an ideal plant to realise and stabilise erosion control structures, while its regular yielding and high market value allow a stable and substantial cash return. In the context of soil and water conservation it has to be understood, that with progressively shrinking landholdings, farmers cannot afford to loose scarce arable land for conservation structures, while *chat* can fill the gap in a very profitable way no other plant could do.

When it comes to the appreciation of *chat* as a consumable commodity, opinions might spread wide apart. Trying to avoid any possible polemic, we will just list hereafter some basic considerations:

Chat is a mild natural stimulant which is not subject to any chemical manipulation for strengthening of its narcotic effect. Its consumption is confined to a limited number of countries in one geographical area, where it is well embedded in century old traditions with high socio-cultural impact, not unlike alcoholic beverages in many other parts of the world. Its negative effect on health and social behaviour, when misused, is moderate and generally limited to few individuals. Educative efforts, eventually combined with adequate legislation to protect minors, should be sufficient to prevent possible abuses. Puritanical trends, like the prohibition period in the USA (1919-33) focusing on the production and marketing of alcoholic beverages, have usually shown little effect on actual consumption, while artificially criminalising its citizens.

Aside from *chat*, the main cash crops are coffee, Irish potatoes and onion, each of which has its specific advantages and problems. Coffee as a perennial crop needs some moderate investment for establishment and involves low to high yearly production costs, depending on cultivation methods. Main problems are connected with the high incidence of Coffee Berry Disease, which is substantially reducing annual yields. Irish potatoes and onion engage high costs for planting material and eventually chemical fertiliser, while needing adequate moisture and soil fertility. They are sensitive to diseases and production involves high risks, especially when cultivated under rainfed conditions. To successfully promote these cash crops, it is recommended to intensify efforts in the field of applied research in order to select more resistant varieties, well adapted to the specific conditions at farm sites, to promote the controlled multiplication of selected planting material at farm level (potatoes, onion) and to exhaust the still existing potential for irrigated land.

Roughly half of the rural population is either not or little involved in cash crop production. While possibilities for complementary income are rather good in normal years, job opportunities on cash crop producing farms are expected to diminish substantially during bad years, narrowing the income possibilities for vulnerable households. In spite of a generally higher food security as compared to areas with mere subsistence farming, part of the rural community remains vulnerable, having very limited means of subsistence and little access to the cash crop economy.

Hararghe's cash crop economy depends mainly on exports to countries in the immediate vicinity. The economy bears certain risks, as could be seen with the ban on livestock sales which is having a negative effect on purchasing power of clients and market prices. Also, the strategy of progressively increasing cash crop production is limited in time and space. Finally, as in other parts of the country, the urgent need for developing industrial activities in order to decongest the agricultural sector is also strongly felt in Hararghe, with farmers seeing no future for their children in agriculture.

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