Coffee and Household Poverty

A study of coffee and household economy in two districts of Ethiopia

Celia Petty, John Seaman and Nisar Majid with
Floor Grootenhuis, Save the Children UK

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Field team: Nisar Majid, Kahsay W/Slassie, Floor Gootenhuis, Duguma Adugna, Chemeda Abedeta, Weyessa Garedew, with Waktole Sori, Habte Jifar and Melkamu Dumessa

Data input: Hannah Arpke

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1.0 Executive Summary

1.1 This study forms part of a four-country research programme funded by DfID. The overall goal is to develop methods of measuring and analysing poverty and modelling the impact of change at household level.

1.2 The focus of this study was on the impact of changes in the global coffee price on household poverty in a coffee producing region of Ethiopia.

1.3 The study was conducted at two sites, one in Goma woreda (district), and one in Mana woreda. Both woredas are in Jimma zone of Oromiya region.

1.4 Household economy methods were used to describe and quantify the components of household income and expenditure, including food production and employment. A representative sample of households was interviewed in both sites.

1.5 Comparisons were made between the income and standard of living of different households and between the two sites. These comparisons were made on the basis of disposable income i.e. income remaining after the household has met its food needs. A minimum standard of living, consistent with Millennium Development Goals was established, using household expenditure data from the study sites.

1.6 The study sites were in comparable agro-ecological areas and have similar local economies. Both sites were affected by three years of very low coffee prices as well as poor cereal production and high cereal prices at the time of the field research. However, one of the sites (Jimma II) was notable for its better organisation of production and better quality control. Additionally, many households in Jimma I had fallen into serious credit problems

1.7 The effect of a change in producer coffee prices on household living standards was simulated using an arithmetic model. The fall in coffee prices has a substantial impact on household disposable income in both communities. The effect is seen across the income distribution (Figs 6a and 6b).

1.8 In terms of the impact on the overall income of the village the effect of the simulation would be to reduce total disposable income between 2000 and 2003 by about 40% in Jimma I and 58% in Jimma II. This change leads to a sharp change in the proportion of households falling below the standard of living threshold: from 30% to 67% in Jimma 1 and from 30% to 53% in Jimma II.

1.9 Taking 2003 prices as a benchmark, the modelling exercise indicated, for each 1% change in coffee price, disposable income in Jimma I would change by 1.5% and in Jimma II by 0.7%

Coffee and Household Poverty:

a study of coffee production and price in two districts

of Ethiopia

2.0 Background

This study was undertaken as part of a DfID funded research programme. The purpose of the programme is to 'develop methods of measuring and analysing poverty and assessing the impact of policies and programmes at household level, in ways that are practical and useful for decision makers involved in poverty and food security'.

The work was carried out in the Regional State of Oromiya in two woredas (districts) Goma and Mana, situated in Jimma zone. The zonal capital, Jimma town, is 335kms southwest of Addis Ababa. Goma is approximately 50 kms[1] from Jimma town and Mana is approximately 20kms[2] from Jimma town. The sites are very similar in terms of agro-ecological conditions and a history of growing coffee.

In both study sites, household economy based methods were used to analyse the impact of the international coffee price collapse on poor households and to define a standard of living threshold.

The analysis presented in this report provides quantitative information on household livelihoods in coffee producing areas, that is relevant to the National and Regional Ministries of Rural Development, the National and Regional Ministries of Trade and Industry and to a range of other agencies, including donors and private sector organisations. In particular, the analysis contributes information that is germane to key strategies in the agricultural development sector outlined under PRSP objectives for Agricultural Development Led Industrialisation.

3.0 The Coffee Sector in Ethiopia

Coffee Growing in Ethiopia

Arabica coffee has its origins in Ethiopia, which remains Africa's largest producer of arabica beans. National production levels are estimated to vary between 140,000-180,000 tonnes[3] and exports account for more than 60% of Ethiopia's foreign exchange earnings. Although yields are low due to the dominance of traditional techniques, low wage rates and good growing conditions make Ethiopia one of the world's lowest cost arabica producers.

[1] 1 hour's drive, mostly on tarmac road with approximately 10mins walk to different village locations.
[2] About 25 minutes drive on tarmac and all weather road, plus an additional 20min walk to the village itself.
[3] Accurate figures are difficult to estimate due to the substantial harvest obtained from semi-wild forest plantations and the portion of the crop consumed on-farm.

An estimated 700,000 households nationally are involved in coffee production[4]. About half of total output is either picked wild or from semi-domesticated forest areas, involving only labour as an input.

Changes in organisation and marketing

Prior to 1991, coffee production and marketing in Ethiopia was centrally controlled under the Ministry of Coffee and Tea Development. Producers had to sell at fixed prices and fixed times during the year. The Ethiopian Coffee Marketing Corporation (ECMC) handled the vast majority of the crop.

Following the overthrow of the Dirgue in 1991, the Government of Ethiopia introduced measures to promote a market economy including liberalisation of the coffee sector. This was undertaken as a means of increasing producer prices, thereby encouraging production, reducing smuggling and maximising export earnings.

The Coffee Marketing Corporation was divided into two public enterprises in 1992/93, one to buy and deliver coffee to auction and the other to buy from auction and export it. Policies now allow private traders to compete with state owned companies. As a result the number of private actors has dramatically increased. However, at the time of writing, domestic traders must sell their coffee at auction, not directly to exporters. [5] [6] The coffee sector is therefore still in transition.

Research and producer support services

The World Bank and the European Commission are among the major donors who have supported the coffee sector. Coffee research is led by the National Coffee Research Centre (NCRC) which is part of the Ethiopian Research Organisation. The NCRC until recently operated a large EC funded Coffee Improvement Project (CIP), which had the following components:

- Provision of free seeds
- Improvement of infrastructure

Historically, extension services have been weak, often top down and with low adoption of extension messages. While improvements have been taking place, the organisation and management of coffee in an area or village can be highly dependent on the local PA , the village leadership and the local trader.

Marketing
During the Dirgue regime sales of coffee by farmers were handled through local co-operatives and in return, a dividend was paid (although payments could be erratic) and agricultural inputs were made available at subsidised prices. During the overthrow of the Dirgue many co-operatives were looted and records were lost (including details of members, debts etc).

In the privatised era the management of co-operatives has been a serious concern. Where the whole marketing system was previously managed centrally, now some co-

[4] (ICO/CFC Study of Marketing and Trading Policies and Systems in Selected Coffee Producing Countries. Country Profile Ethiopia. 2000)
[5] This system is currently under review
[6] Private traders currently account for 85% of deliveries to the auction, and the number of private exporters has increased from 14 to 240 (about 75 of which are active).

operatives are trying to compete in a liberalised environment. For example, some co-operatives take their own coffee to the central auction, although they may lack the necessary skills and experience to manage that situation. Finally, the introduction of private traders has brought with it loss of control over coffee provenance. Difficulties concerning verification of the origin of beans causes serious problems at export level in relation to quality, taste and price.

Role of traders in local production
Many private traders who made profits purely by trading in the period following liberalisation when prices were high, began to purchase processing equipment when prices fell. With very poor rural infrastructure and very low rural incomes, this meant that traders in some places became the dominant local economic actor (many farmers are unable to raise the capital to transport their coffee to another potential buyer).

Traders can also influence the quality of production. If they are long-term investors in a local area, they may well support producers in improving the quality of coffee. However, if they take only a short-term view, local farmers will not be supported in improving the quality of their coffee.

Rural credit programmes

During the Dirgue regime, the National Bank controlled the working of the three main banks, the Commercial, Development and Mortgage banks. The banking sector was liberalised in the early 1990s, when private banks were encouraged to compete against the government banks.

The Commercial Bank is the major rural bank, and has expanded since liberalisation. It generally provides credit through the service co-operatives. Some communities have experienced serious problems of indebtedness, following the collapse of prices in 2000. This includes one of our study sites.

Employment
Large numbers of labourers gain seasonal employment on farms during coffee harvesting. During the period September to November, harvests of red coffee beans, maize, teff and sorghum all take place, generating a high labour demand. Migrant labourers from areas to the south of Jimma zone, particularly from the SNNPR (Southern Nations, Nationalities and Peoples Regional State) come for work, as well as the local poor.

Coffee Exports
The Coffee and Tea Authority (CTA) is responsible for regulating the quality of exported coffee. Annual exports fluctuate between 1.3 and 2m bags. The major export market is the European Union, which receives about half of Ethiopian exports, with Germany receiving the largest share (50-60% of EU imports).

Some gourmet coffees and two co-operative unions producing organic coffees have been given special permission to by-pass the auction and sell directly to major export markets.[7] Otherwise, all coffee is sold at auction. (In principle coffee can only be used for domestic consumption if it is rejected for export by the CTA on quality

[7] It is not always clear whether the organic premium is worth the additional costs, compared to improving overall mainstream coffee quality

grounds). The auctions are conducted by the CTA and are held in Addis Ababa for most coffees and Dire Dawa for Harar coffee.[8]

Production Systems
Agricultural land is owned by the Government of Ethiopia. There are 4 main coffee production systems:

- Forest (10%)
- Semi-forest (35%) (mixture of semi-forest and garden coffee in our sites – indigenous trees give shade to coffee plants, increasing yields)
- Garden (50%)
- Plantation (5%)

Although the majority of Ethiopian coffee is organically produced, the cost and complications of obtaining organic certification mean that only a few producers benefit from these arrangements.

The vast majority of production is from small-holder (garden) production. These are rain-fed and generally low input-output farming systems, with most farmers planting less than 1Ha to coffee. Coffee management is minimal, with coffee generally grown under tree/forest canopies with little pruning, field hygiene, or stumping. The low input characteristic of farming in many coffee growing areas means that much of Ethiopia's production can be considered organic, although little certification has taken place as yet. Lack of management means harvests occur in a regular fluctuating cycle: peak/high; low; medium; peak/high etc.

4.0 Introduction to the Study Areas

Two assessments were carried out between June and August 2003. Study 1 was carried out in Jimma I in Goma woreda. Study 2 was carried out in Jimma II in Mana woreda[9].

Both woredas fall within Jimma Zone, located in the south western part of the Regional State of Oromiya. The zone encompasses an area of approximately 19,300km2. Jimma town is the capital and administrative centre of the zone, 335kms from Addis Ababa. Altitude in the zone varies from 880 to 3,340ms above sea level; the topography includes mountains, dissected plateaux, hills, plains, valleys and gorges. There are several perennial rivers and intermittent streams.

The zone is classified in to three agro-climatic zones: kolla (14.9% - highland*);* woinadega (64.6% - mid highland); dega (20.5% - lowland). High forest, woodland, riverine, shrub and bush, and man-made forests are all found in the zone.

The study sites were within the woinadega zone.

[8] (Source: Organic Coffee Production: Hope for Small-Scale Farmers in Ethiopia. Kufa, T., Shimber. T. Ethiopian Agriculture Research Organisation, Jimma Agricultural Research Centre).

[9] Both study sites were within reasonably close proximity of a good road. As the research was done in the middle of the rainy season, the sites were within 1 hour's travel time (driving + walking) of the team's base in Jimma town.

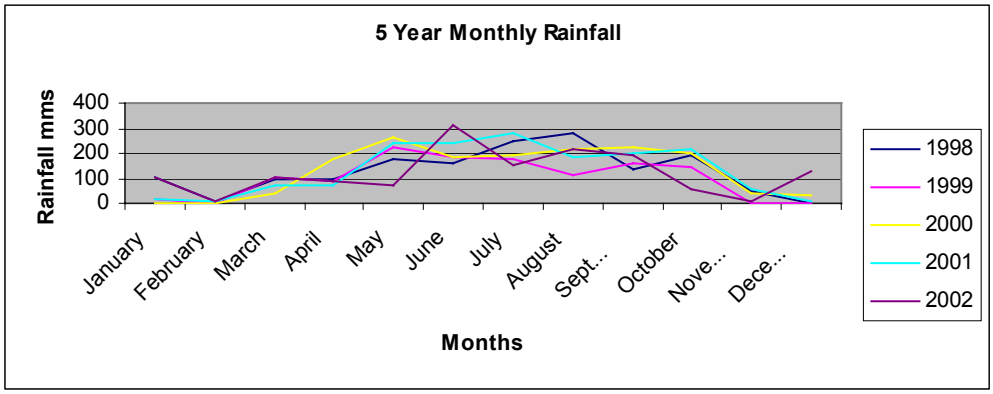
The population of the zone is around 2m, of which approximately 5% live in Jimma town. Jimma town is by far the largest urban centre in the zone. Crude population density is 106 persons per km2.

There are approximately 644kms of all weather roads and 447km of dry weather roads, in the zone.

The zone has large areas of potentially cultivable and irrigable lands. In 1999/2000 about 45% of the total zonal area was arable (of which 30% was under cultivation); 14% grazing and 27% forest land (including bushes and shrubs).

Rainfall variation across the whole zone is between 1,200 and 2,400mms per year, with a long rainy season from February/March to October/November.

Source: Jimma Agricultural Research Centre (Jimma Weather Station – 1,753m)



Army worm, aphid, stalk borer, ape, monkey, warthog, pig, baboon and porcupine are the major crop pests. Leaf rust, leaf blight, head and leaf smut and seedling blight are the major crop diseases.

Of the 13 woredas in Jimma zone, Goma, Manna, Limmu Seka and Limmu Chekorsa woredas are known as the predominantly coffee growing areas.

Each woreda is further divided in to PA's (Peasant Associations), with each PA containing several villages.

Location of the study sites

The main purpose of the study was to demonstrate a methodology, and to illustrate the range of problems it could be used to explore. Sites were therefore selected on the grounds that these villages would provide a picture of the range of production and employment options available to households in a coffee producing area, with reasonably good links to the wider economy. They also needed to be accessible during the rainy season when the study was carried out.
Studies were carried out in Goma and Mana woredas

Study area 1: Goma woreda (district)

Goma woreda is situated about 60kms to the west of Jimma town in the northwestern part of Jimma zone. The study site, (Jimma I) is only 1km from the main road and 5-10kms from Agaro, the woreda capital.

The woreda falls under two agro-climatic zones: woinadega (96% - mid highland) and kolla (4%- highland)

Rainfall varies between 1,200 – 1,800mm.

The population in 2002 was estimated at approximately 300,000. It is the second most densely populated district in the zone at 193km2.

62% of the district area is considered arable (49% under cultivation), with 10% for grazing and 5% for forest.

Maize, teff, sorghum, enset, horse bean, wheat, barley and field pea are the pre-dominant crops cultivated. Chat is also cultivated. However the relative importance of these varies within the zone.

Average annual crop losses, to pests and disease is put at 30%.

Coffee is the major cash crop and one of the villages neighbouring the study site is considered one of the original coffee producing sites in the country.

The general farming activities are traditional coffee cultivation, with various annual crops (maize, sorghum, tef, wheat, barley, some pulses and oil crops),and livestock grazing on grazing land and fallow lands. Multi-purpose trees such as Albizia, Cordia, Croton and Podocarpus are found near homesteads and in coffee farmlands (to provide shade).

Goma woreda can be divided in to three distinct food economy zones (FEZs) [10]: coffee dominant; mixed farming; cereal dominant. Our study took place in coffee dominant zone A[11]

Coffee dominant. (zone A)

Most of this food economy zone is in the mid-altitude agro-ecological range. Coffee is the dominant cash crop and maize is the dominant cereal crop. The contribution of other crops to the household economy is relatively small compared to coffee and maize. Other cereal crops grown however include sorghum, enset and teff.

This FEZ generally has better access to infrastructure – roads, markets and government services (extension, schools) – than other food economy zones within the district. This can be explained by its coffee production and the priority such areas have been given by past governments. The recent EC funded CIP programme also focused on infrastructure improvements to support the coffee sector.

The zone also has more horticultural crops (with the exception of enset) than the other two zones. Land-holdings however are smaller in this zone than the others. Livestock holdings per household are also smaller but the higher density of people means overall numbers may be comparable. Few mules and horses are found in this zone.

[10] A Food Economy Zone is defined as a population where most households obtain their food and cash income by roughly the same combination of activities

[11] The other two Food Economy Zones in Goma woreda include a mixed farming zone and a cereal dominant zone. Information on these two Food Economy Zones is provided in Appendix 1

Honey cultivation is lower in this zone than either of the others.

The total number of households is approximately 20,156 [12](this only includes households that paid land tax; families living with parents on the same land are not included)

The study site (Jimma I) is divided in to 3 main sub-villages around a common wetland, used for communal grazing. The village is around 1-2kms from the main road and 5kms from Agaro, the district centre.

Jimma I consists of 120-130 households.

Study area 2: Mana woreda (district)

The second study was carried out in Mana woreda, the smallest district in the zone. The district is only 30-40kms from Jimma town.

Mana woreda is found in central parts of the zone. It has an area of 480km2 and one urban centre, Yebu town, the district capital. It lies between 1,470 and 2,610m. It is classified in to dega (12%), woinadega (63%) and kolla (25%) agro-climatic zones.

It is the most densely populated district in the zone, at 308 persons per km2. Actual population is estimated at 112,541.

Average rainfall is 1,467mms.

89% of the district area is arable (with 86% under cultivation), 2.7% is grazing and 2.8% forest lands.

Maize, teff, sorghum, barley, wheat, coffee and horse bean are the most widely cultivated crops in the district. Chat is also cultivated. Stalk borer, lady bird beetle, ape, warthog, porcupine and pig are major crop pests.

Compared with other woredas in Jimma zone, Mana has a high population density, smaller size and relatively better access to infrastructure and services.

Mana can be divided in to 4 distinct food economy zones: coffee dominant A, coffee dominant B, mixed farming C and mixed farming D. [13]

Coffee dominant (zone A)

The study was carried out in coffee dominant food economy zone A. This zone is very similar to zone A in Gomma. Coffee and maize are the dominant crops. Farm sizes are small (0-0.25Ha, could be more – mostly maize). Livestock are kept and some horticultural activities take place. Honey production is thought to be increasing and petty trade decreasing (esp. due to decreasing coffee prices). Forest products use is increasing. The PA's in this zone have relatively good access to infrastructure such as roads and coffee processing plants. There are 5 coffee processing plants in this zone.

The study site, Jimma II comprises of 120-130 households.

[12] These are not official figues – not official. Central Statistics Authority has only official figures, but for older un-merged PA's/Kabbale)
[13] Information of zones B, C and D can be found in Appendix 1

Characteristics of the Study Sites

When the study was conducted in June-July 2003, both sites were experiencing their third consecutive 'bad' year, due to a series of very low coffee prices, as well as poor cereal production; at the time of the field research high cereal prices were high. Most households claimed that the current and previous agricultural years (2001/2002) were the worst they had faced for some time. The last good year was the 1999/00 season, when prices for red cherries and dry beans were between 1 and 3 Birr/kg and 1- 2Birr/kg respectively. Current prices were 0.5 Birr/kg for red berries and 1 birr/kg for dry beans.

While this picture was similar for the two villages, Jimma I, was notably worse off. Many households in Jimma I had been affected by credit problems as well as low coffee prices and poor cereal production. Loans supplied by local banks to encourage farmers to invest in coffee in 1998-2000 when prices were higher, became difficult to pay back after the price collapse in 2000/01. A number of farmers had been forced to sell their corrugated iron roofs and livestock to repay loans. In addition, the local co-operative, in trying to sell coffee directly at the Addis auction had received a bad cheque in payment from an unscrupulous buyer, causing a serious loss of income for farmers whose stock it had sold on credit.

There were also differences in co-ordination between the local coffee production and marketing actors – the villagers themselves, the government extension services and the local traders. This was much better in Jimma II than Jimma I. One of the results of this was that Jimma II farmers often received a small premium for their coffee as traders had more confidence in its quality. There was also a greater sense of organisation in Jimma II (and more generally across Mana woreda) and greater awareness of the importance of controlling and improving coffee quality through the production and marketing chain.

This co-ordination, and the lack of it in other woredas, is partly the result of the individuals concerned (village leaders, extension staff and the local trader). However, the discrepancies are also characteristic of the present period of change in Ethiopia, including the partial liberalisation of the economy and the increasing decentralisation of government.

Other factors influencing coffee and other income and production in the study sites include

(i) Management of the coffee plants. Coffee production follows a natural peak and trough cycle. This is roughly a 3-year cycle, with a good harvest, followed by a poor harvest, followed by an intermediate one. The cycle also depends on climatic conditions and disease loads, as well as pruning. Better coffee crop management would stabilise these fluctuations.

(ii) Pest and storage problems. Monkeys are major pests for the grain crop, which has to be protected day and night as the grains are maturing. Loss of forest habitat may be a reason for the high level of losses from Colobus monkeys. This region also has a long rainy season, with wet and humid conditions that produce crop diseases and limited storage potential.

(iii) Landlessness. Many of the poorest households in the study group were often newly married couples, with no land of their own, although very small families.

(iv) Alternative food crops. In Jimma II, the use of the enset tree for making staple food was notable. This had been introduced by a minority population (Yem people), who come from enset producing areas. However, non-Yem households had also started to use the tree, to reduce food security risks. The tree is easily grown in the home plot, is relatively resistant to pests and climatic variation and does not have storage constraints as it can be harvested when needed. For the non-Yem majority of the village, enset was considered a 'poor man's' food.

(v) Sharing arrangements. In common with other parts of Ethiopia, many different sharing arrangements take place between farmers. Some examples include:

- A *yakuto* arrangement for maize; this may see a landowner, oxen-owner and labourer joining forces to work the land of the landowner. Where the landowner contributes his land, and the oxen-owner his oxen for ploughing, the labourer will do most of the manual work (planting, weeding, protection from pests, harvesting). All will contribute to the input costs (fertiliser, pesticide) for a three-way share of the harvest. Variations on this theme may take place.

- Various arrangements exist for sharing livestock (*arasi*), where a cattle owner may lend a relative a cow, for example. In return for looking after the cow, the relative will have access to 50% of the milk and 1 out of every 4 of the offspring.

- The cultivation of teff requires many hands, particularly in the ploughing and planting stage. Villagers often group together and, in rotation, take turns to work each other's land.

5.0 Field Work and Assessment Methods

The study was mainly conducted by a team of six, three of whom had prior experience of the standard Household Economy Approach (HEA). The other three were all degree and/or Masters holders from the Jimma Agricultural Research Centre and the University, and although initially recruited as translators were soon acting more as research assistants, conducting some interviews themselves. In addition to the core 6, another 3 people were employed at various points, also as translators, in order to maximise work output.

Information was obtained from secondary sources, 'key informants' (individuals with specialised knowledge of particular subject) and from interviews with a sample of households

Background information on the population and the economy of Jimma, Goma and Mana districts, with specific reference to coffee production and trade was collected from secondary sources before the start of the study .

The study sites were selected in consultation with district agricultural officers and other local administrative officials. The purpose of the study was explained, and its potential contribution to local decision making and poverty reduction processes was discussed. The final site selection was made at PA level. PA leaders facilitated introductions with the village chairman and other leaders.

At each study site a comprehensive list of all crops, (including minor crops, fruit trees, timber, fodder, vegetables etc) and all livestock and their uses (traction, milk, meat, live sale and sale of products) was compiled from interviews with farmers (men and women selected from different economic groups), and with agricultural and livestock

extension workers. The results from these interviews were cross-checked to reach a consensus view. A list of market prices for all traded produce was compiled, together with conversion rates for local measures.

For each agricultural activity information was obtained on:

(I) Seasonal agricultural labour requirements (crops and livestock) i.e. a labour calendar, identifying the labour required for a defined area of land (i.e. – actual amount used) for each task (e.g. land preparation), and who (men/women/children) typically does this work.

(II) The costs of all crop and livestock inputs (land, labour, fertilisers and pesticides, veterinary services etc) and the yields expected at different input levels and details of seasonal prices.

(III) Employment. For each type of paid employment (including salaried and self employment):

- An estimate was obtained of the amount of labour typically available for each type of employment (days per month), seasonal variation in this, wage rates, and the requirements (age, gender, skill or qualification) for employment.

- Information on markets was obtained from key informants and the secondary literature. This included the names and locations of local markets for goods and services. Information on the operation of markets for major traded commodities, including how prices are set, was obtained from interviews with traders in those commodities (e.g. primarily based on levels of competition between traders)

At each of the study sites, two samples of households were drawn, one for long interviews and one for short interviews

Long interviews:	Site 1 (Jimma I)	20
	Site 2 (Jimma II)	19
Short interviews..	Site 1 (Jimma I)	27
	Site 2 (Jimma II)	28

6.0 The Analytic Approach

In order to make meaningful comparisons between the income and standard of living of different households, food and non-food income must be reduced to common terms. There is no completely satisfactory way of doing this. The households included in the study obtain part of their income as food produced for consumption and part in cash (from the sale of food and non-food crops, employment, remittances and gifts[14]). Converting all income to its money equivalent runs into the difficulty that there is no market for almost all of the food produced. Of the foods produced for consumption a producer price could be established only for ensett, sorghum and cabbage. In a year of low maize production no maize was being sold. Conversion of income to food energy (kilocalories (kcal)) is also inexact as the quality (i.e. nutrient content) of food produced for consumption varies between households. (A list of income sources is given in Annexe 2).

[14] 'Gifts' include all transfers between households on 'non-market' terms. This would include charitable gifts, gifts between kin, reciprocal arrangements between households etc.

Further, the interest in this study is not in income as such, but in the standard of living. This is more satisfactorily represented by the 'disposable' rather than total income of each household i.e. the amount of money remaining to the household after this has met its food costs. The household information has therefore been organised in the following way:

Disposable income

The results of the analysis have been presented in terms of household disposable income, defined as the money remaining to the household after its minimum food needs have been met.

- Household food energy requirement has been estimated by calculating the sum of the requirement of three age categories: Adults, 2500kcal/day; older children (aged 12 to 18), 2300 kcal/ day; and younger children at 1500 kcal/day. These requirements were adapted from World Health Organisation estimates [15].

- Any household food needs not met by household production (most households were found to produce less than they consume) is satisfied by the purchase of maize at the prices prevailing at the time of the study. This food item was chosen, as it is reasonably representative of the diets of the poorest households in the longer detailed household interviews.

Total household income, including the value of food grown for consumption has not been shown for the reason given on p15 above.

'Adult equivalents'.

To ensure the comparability of disposable income between households, results have been standardised in terms of 'adult equivalents'. The number of adult equivalents/ household = the total annual household food energy requirement / average (male and female) annual adult energy requirement (2,500kcal).

The standard of living. A minimum standard of living has been defined as the cost to a household of meeting:

- basic household expenses i.e. kerosene (for lighting), matches, and household utensils. Additionally an allowance has been made for seeds as this is a regular expenditure even of poorer households.

- personal expenses i.e. clothing, soap and medical costs.

- primary school costs i.e. uniforms and books.

Estimates of the costs of each of these have been made from the long interviews of poorer households at each site. As the difference in costs in each category at each location is small, an average has been taken**:** Household costs = birr 225: personal expenses = 30: primary school costs =35.

This estimate provides a minimum standard of living consistent with poverty reduction targets and the Millennium Development Goals (MDGs) in nutrition, basic

[15] World Health Organisation (1985) Energy and protein requirements. WHO technical report series 724. Geneva.

needs and access to services. Income is of course only one element in achieving poverty reduction and broader MDGs: investment in health, education, and other social and physical infrastructure is equally necessary. However, children in households where disposable income cannot meet the basic requirements set out in this report, will inevitably have fewer developmental opportunities and worse life chances than children from households that do.

As the household demographic composition varies between households, the cost to each household of achieving the minimum standard of living has been calculated for each household as:

Household expenses + (personal expenses * number of people in household) + (number of primary school age children * cost per child).

This approximates the efficiencies which larger households may enjoy in the consumption of some items (e.g. a larger household is likely to spend less per person on fuel for household lighting and utensils) and the larger cost associated with larger numbers of people and school age children.

Comparisons between the disposable income of households within and between sites are therefore in reasonably common terms. Approximations aside, the only specific omission is in terms of differences in the food quality (nutrient composition) of food grown by each household for its own consumption.

The quality of the income estimates.

There is no absolute measure of this. The long interview technique used includes several checks for internal consistency and plausibility [16]. The chief potential sources of error in the short interviews appear to be:

(i) The omission of income sources. As care was taken to identify all sources of potential income in each area before designing the short interview questionnaire we are reasonably confidant that this did not occur. It is probable that, particularly in the poorest households, minor sources of income were underestimated, the most likely source of error being some degree of 'self-provisioning' by children [17].

Coffee production has been estimated as an average return per bush. As coffee production / bush varies from year to year this ensures consistency in the analysis. Coffee returns have been taken at 1kg per bush

Note that except where otherwise indicated, all quantitative results shown by household are presented in ascending order from the poorest to the richest, *where the relative income level is set in terms of disposable income*.

[16] See The Household Economy Approach, op cit.

[17] This was not investigated. Poor hungry children find additional food where they can by hunting, begging and undertaking small tasks in exchange for food.

7.0 Results

(i) Sources and levels of household income

At both study sites food and cash income are obtained from a range of food and cash crops, livestock, employment and gifts (Figure 1, Sources of income Jimma I ;Jimma II)

Table 1 shows the contribution of all cash income sources (i.e. not including the value of food grown for consumption) to the total village income at each site. Coffee and coffee related activities make up 46.9% (Jimma I) and 49.2% (Jimma II) of all cash income. Figure 2 shows sources and levels of household income by household.

Table 1 Contribution of all sources of cash income to total income.

	Jimma I	Jimma II
	% of all cash income	
Sale coffee production & coffee gleaning	32.7	40
Coffee related employment	14.2	9.2
Chat/ Chat trade	7.4	4.2
Sale livestock & livestock products	24.1	3.2
Agricultural/ casual labour	15.6	0.1
Petty trade/food sales/self employment/remittance	6.1	3.3
Crop sales	0.0	0.4

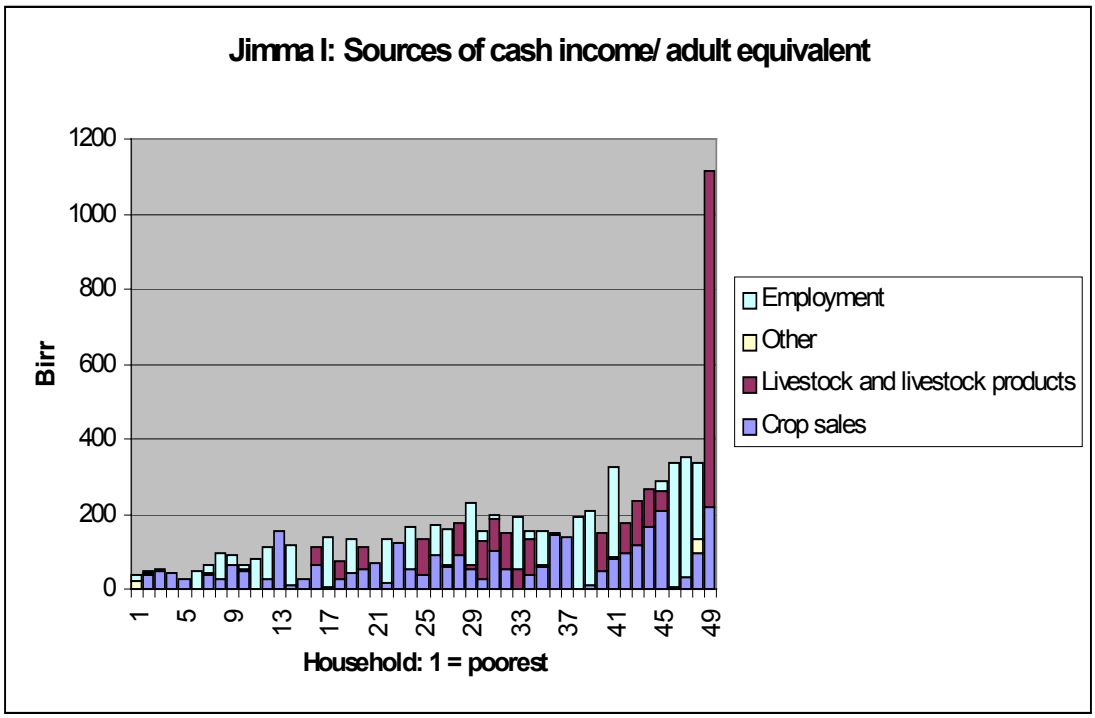
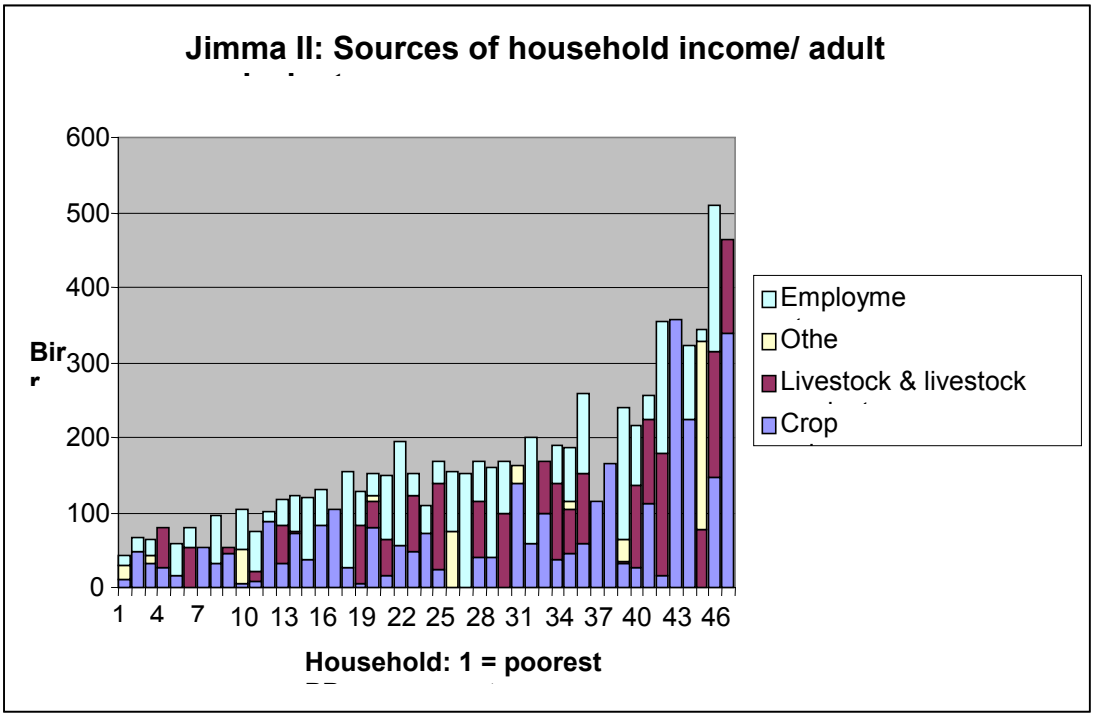
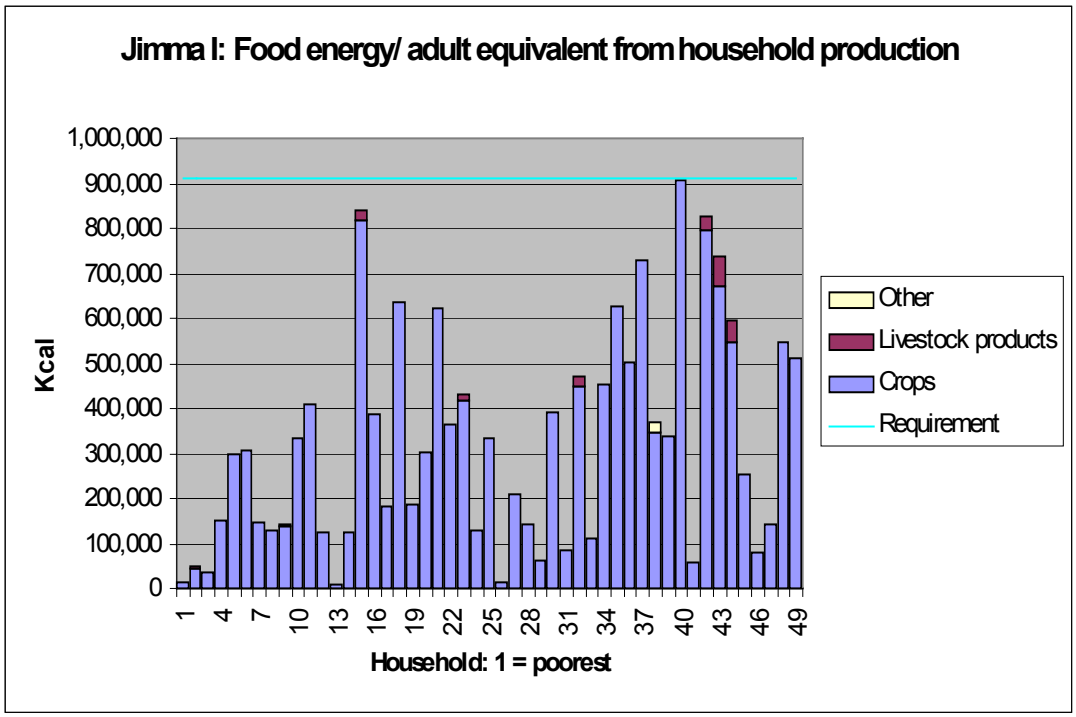


Fig 1a (above) Jimma I: Sources of cash income/ adult equivalent

Fig 1b (below) Jimma II: Sources of cash income/ adult equivalent





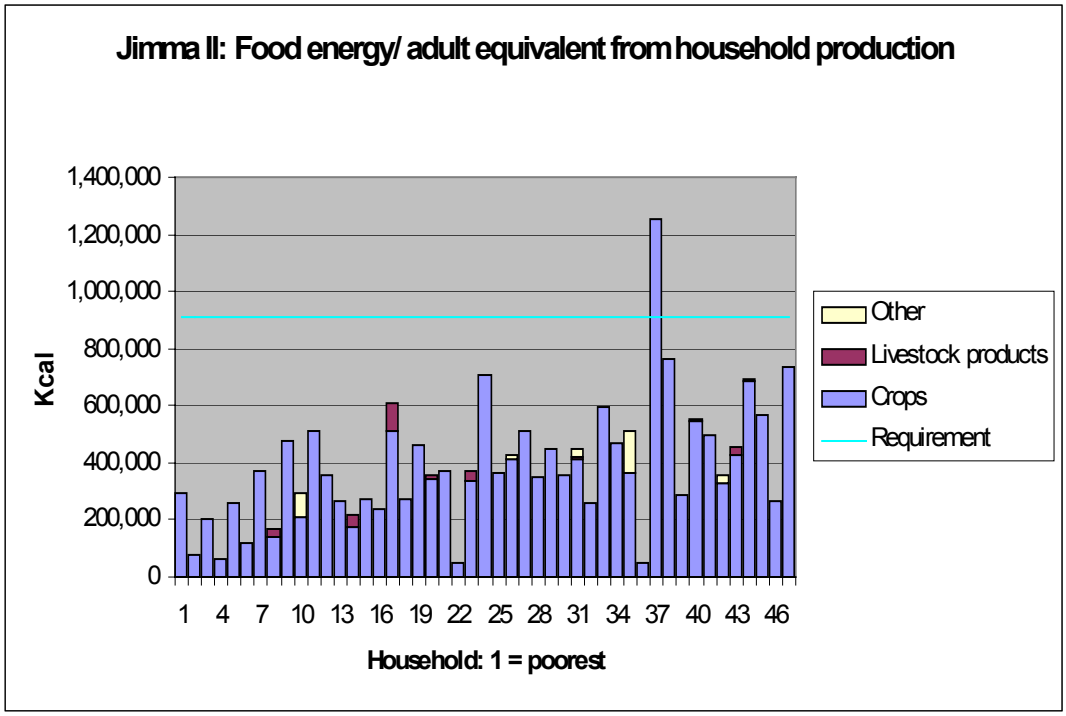


Fig 2a (top) Jimma I: Food energy/adult equivalent from household production

Fig 2b (bottom) Jimma II: Food energy/adult equivalent from household production

Figures 2a and 2b show the contribution of household food production to household food requirement. Although for the reasons given it is not possible to accurately value this in money terms, the cost of meeting the energy requirement of one adult equivalent in terms of purchased maize would be approximately Birr25 / year.

Figure 3 shows the contribution of coffee and chat to total cash income by household.

Figure 4 shows the proportion of household income obtained from coffee sales. Coffee accounts for a higher proportion of income in Jimma I than in Jimma II, reflecting the fact that there are fewer alternative sources of income or employment in Jimma I

Average cash income at the two sites is similar (Jimma I Birr169 and Jimma II Birr170).

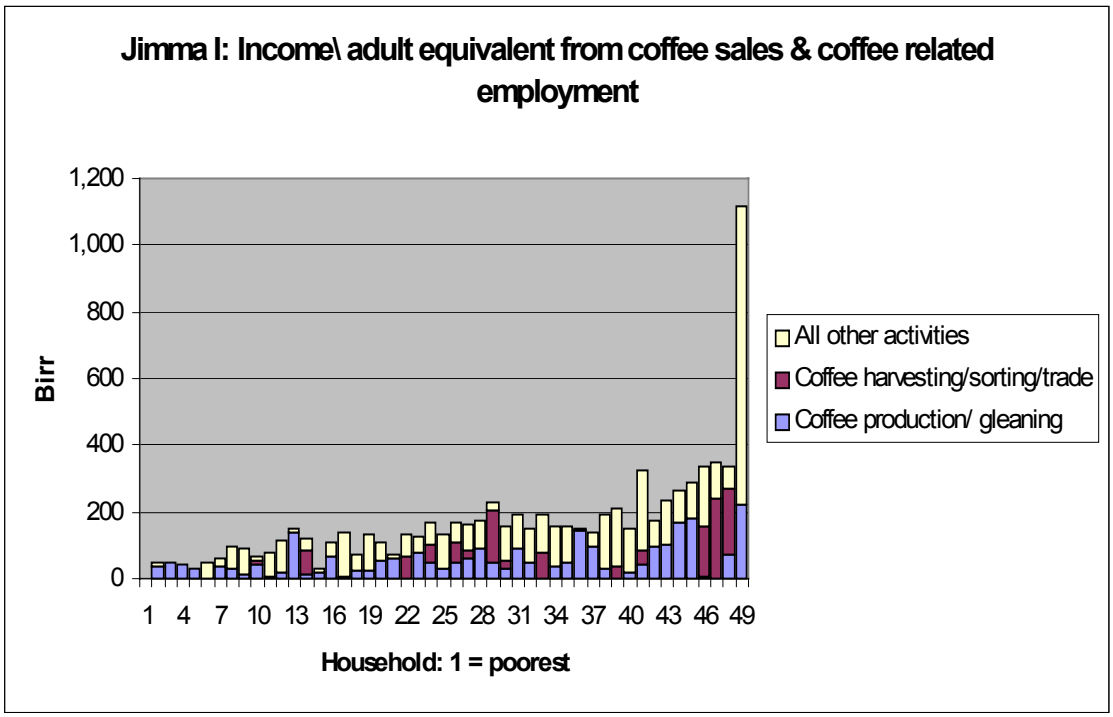


Fig 3a Jimma I (above) Income from coffee sales and coffee related employment

Fig 3b Jimma II (below) Income from coffee sales, coffee related employment and chat

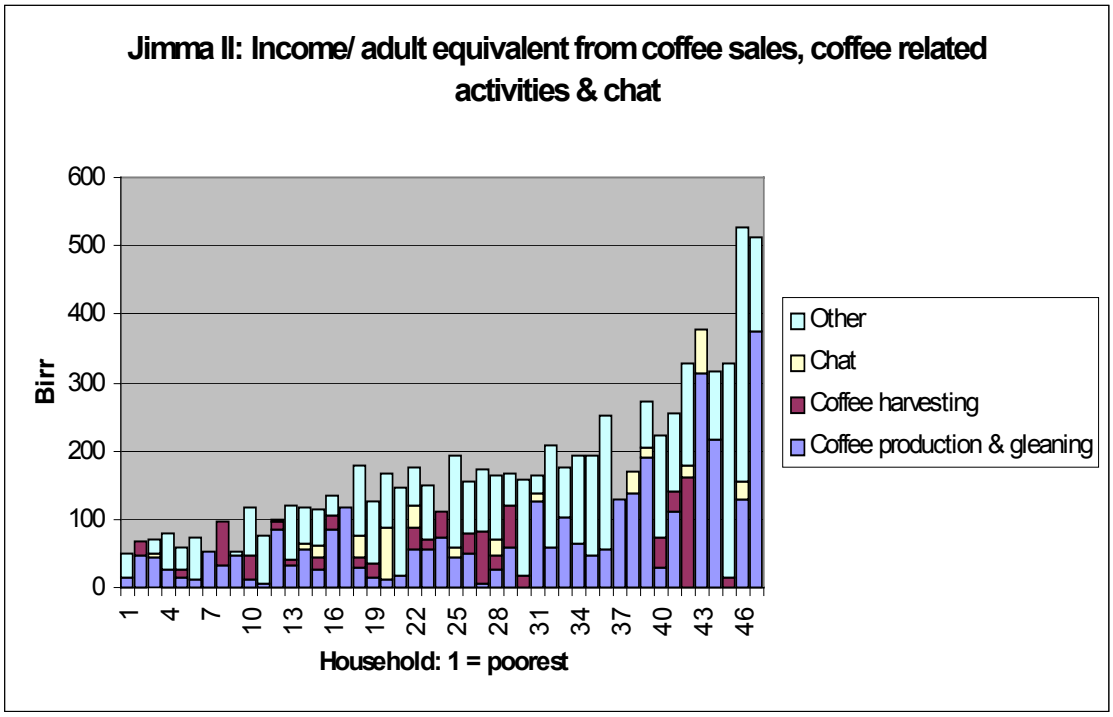


Fig 4a Jimma I Proportion of household income derived from coffee sales and coffee related activities

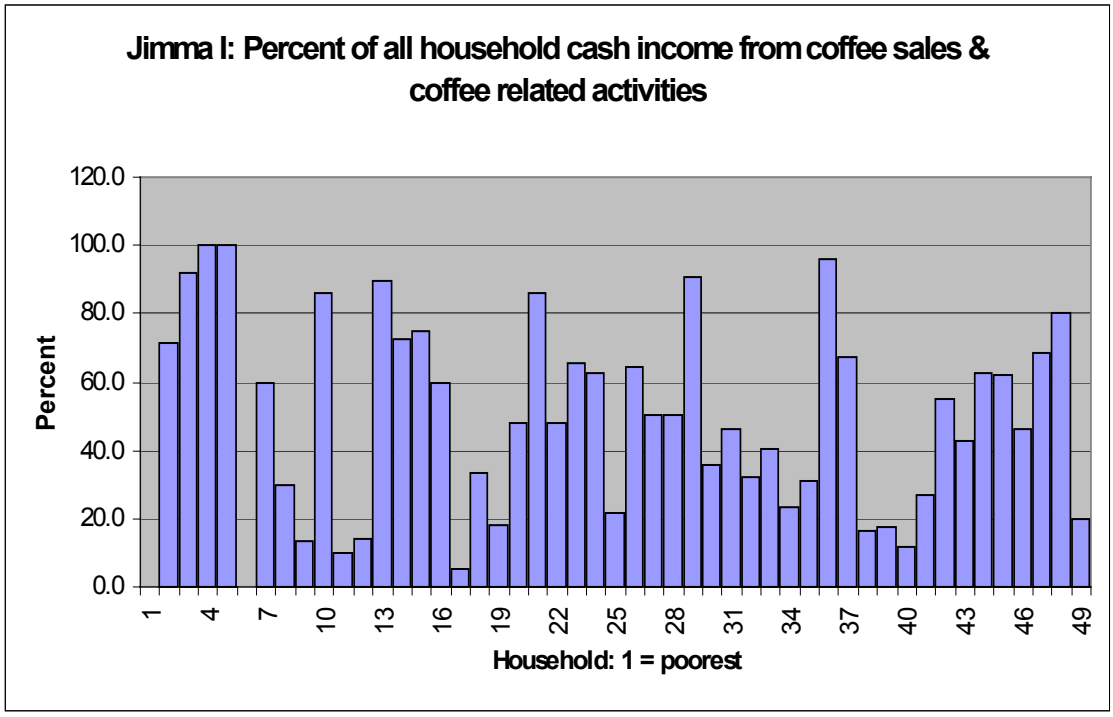
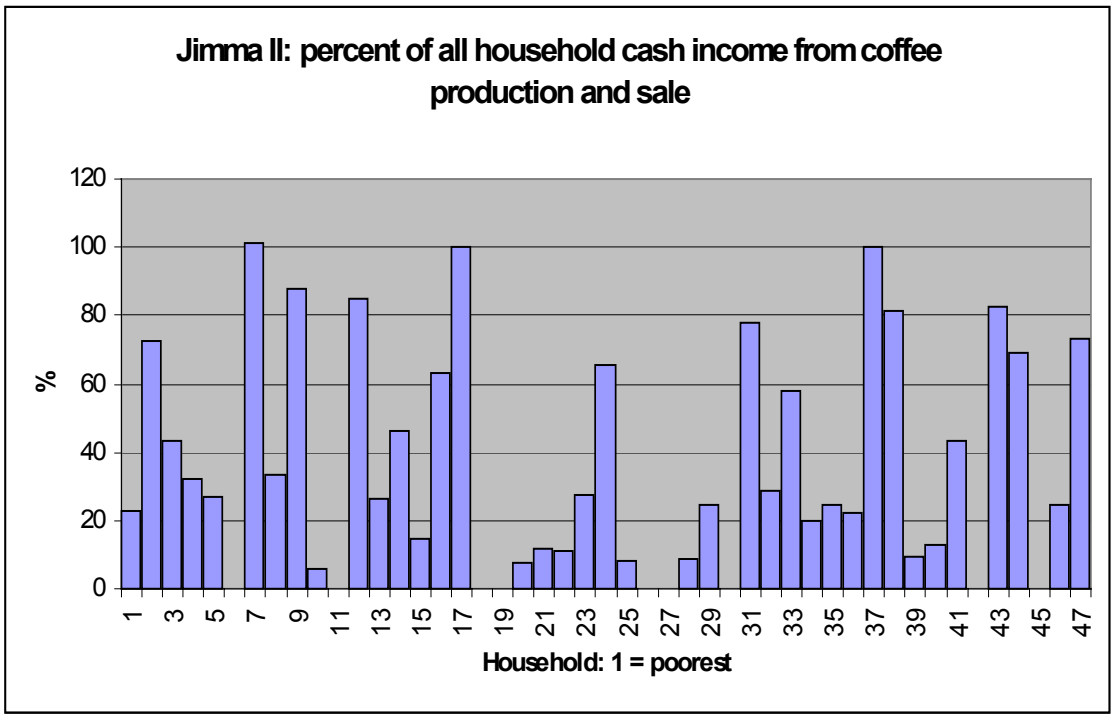


Fig 4b Jimma II Proportion of household cash income from coffee production and sale



Disposable income and the standard of living.

Household disposable income (described in section 6) is shown in Figures 5a and 5b (Jimma I, Jimma II). In each case some of the poorest households show a negative disposable income.

This implies that the household is unable to meet its food needs, to the food quality defined in section 6 above i.e. to meet this level of consumption, it would have to spend more money than it has available from other income sources. In turn this implies that (i) the household is actually consuming less than this quantity and/ or (ii) for the reasons given in section 6, household income has been underestimated. It is likely that for the very poorest households both explanations hold i.e. wild foods and self-provisioning add to the recorded food income, and energy intake is lower than the requirement set. The observed household standard of living in the very poorest households was very low. Energy intake in range of 75%-85 % of requirement was recorded in the poorest households in some of the long interviews.

Average disposable income in Jimma I (Birr101) is slightly lower than in Jimma II (Birr111). In Figure 5 households falling below the calculated standard of living threshold are shown in red (67 % in Jimma I, 53% in Jimma II).

Fig 5a Jimma I: disposable income/adult equivalent. Households below survey standard of living threshold in red (see pp16-17)

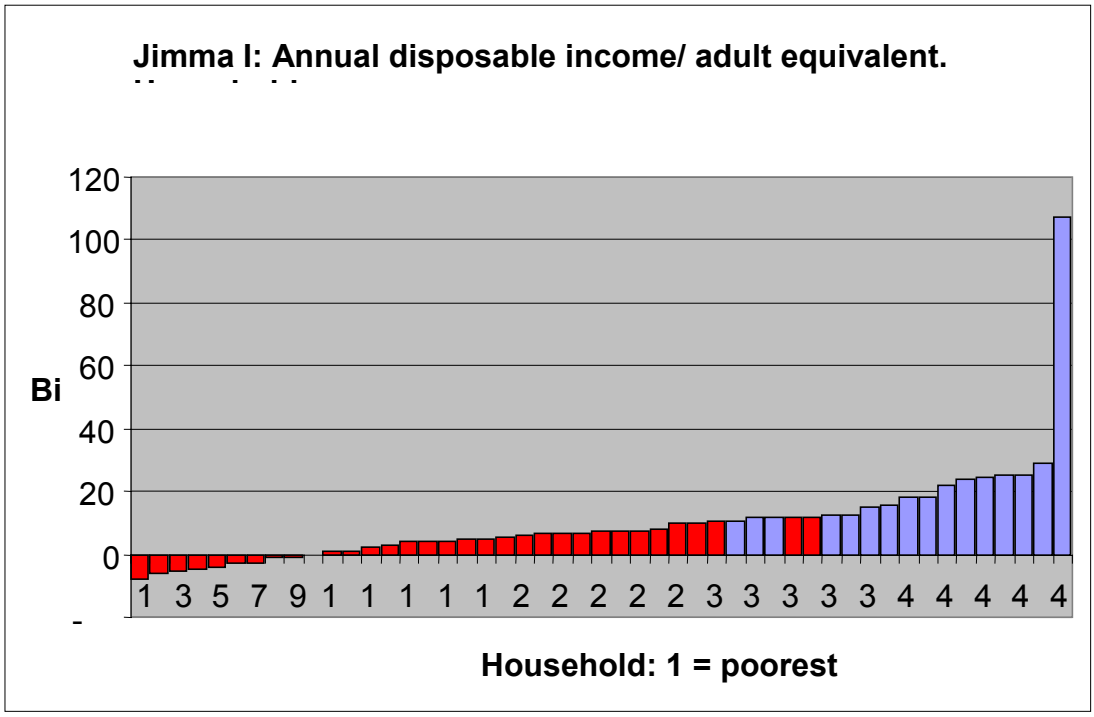
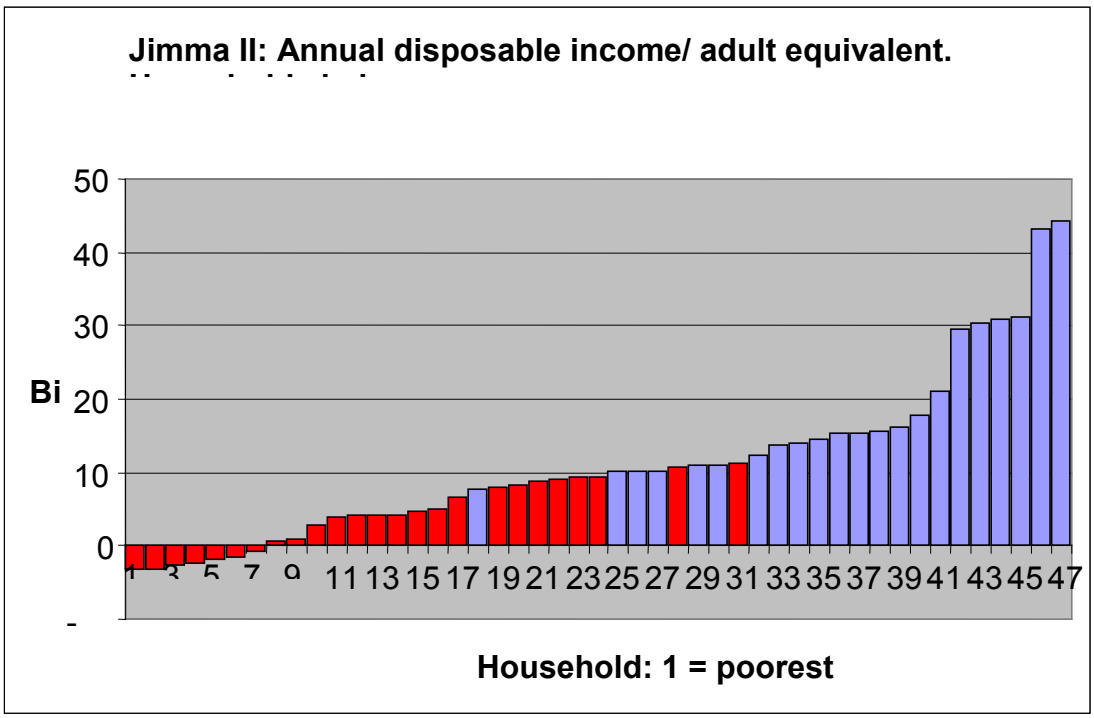


Fig 5b (below) Jimma II: Annual disposable income/adult equivalent. Households below survey standard of living threshold in red (see pp16-17)



Coffee price changes, household income and standard of living

The primary aim of this analysis is to relate changes in the international coffee price and the income and standard of living of coffee producing households.

To demonstrate the effect on household disposable income and the standard of living from changes in the producer coffee price, a simple arithmetic model has been used (see Annexe I)[18]. This simulates the impact of a change in household income resulting from a fall in coffee price. The analysis was carried out using purpose-designed software.

The simulation that has been conducted compares the effect on disposable income and standard of living of the change in coffee price between 2000 and 2003. The prices used were obtained during the survey. 2000 was used as the point of comparison as this was a year of high coffee prices and the most recent for which information was available for Jimma II. The following price changes have been used for coffee sold 'red' and 'dry' at the two sites.

	Jimma 1		Jimma II	
	2000	2003	2000	2003
	Birr/ Kg			
Coffee red	2.5	0.5	1.75	0.5
Coffee dry	1.75	1	3.7	1

Table 2 Coffee prices, Jimma I and Jimma II, 2000/2003

The simulation is based on the assumption that households would have maintained broadly the same pattern of economic activity over the 3-year period to which the model is applied, which seems probable in this case. The change in labour opportunities which might be expected to follow a sharp price change have not been included as the necessary information is not available. However coffee related labour makes up only a small part of village income (table 1) and the effect of this on income is not likely to be large.

The simulated effect on household disposable income of a simulated fall in coffee prices is shown in Figures 6a and 6 b and for the two villages combined in Figure 7.

In terms of the impact on the overall income of the village the effect of the simulation would be to reduce total disposable income between 2000 and 2003 by about 40% in Jimma I and 58% in Jimma II.

This change leads to a sharp change in the proportion of households falling below the poverty line, from 30% to 67% in Jimma 1 and from 30% to 53% in Jimma II.
The effects of the price fall on individual household disposable income is shown in Figures 6a and 6b below.

[18] See also 'The Household Economy Approach', op cit.

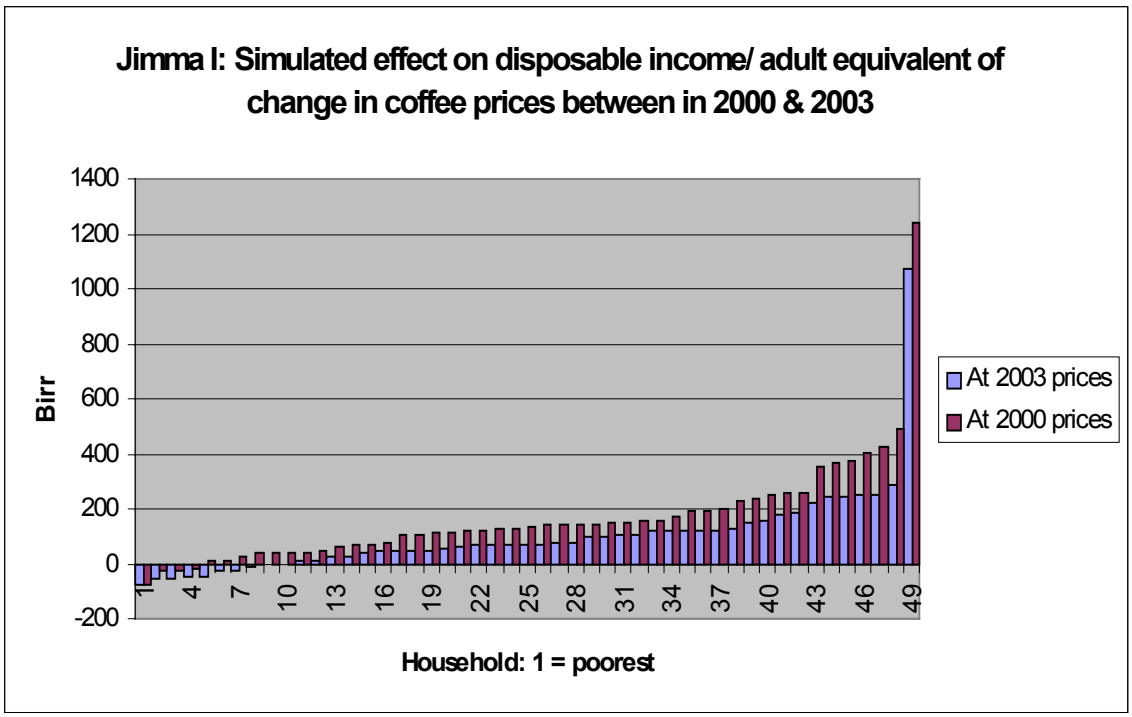


Fig 6a (above) and Fig 6b (below) Simulated effect on disposable income/adult equivalent of change in coffee prices, 2000 and 2003

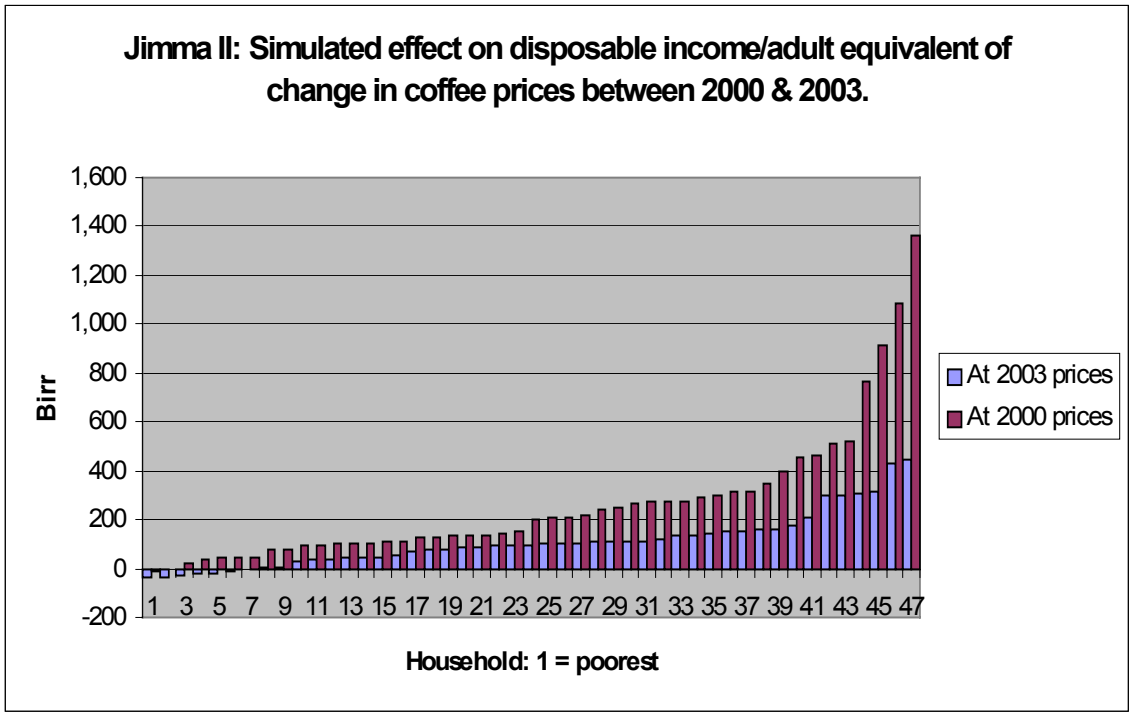
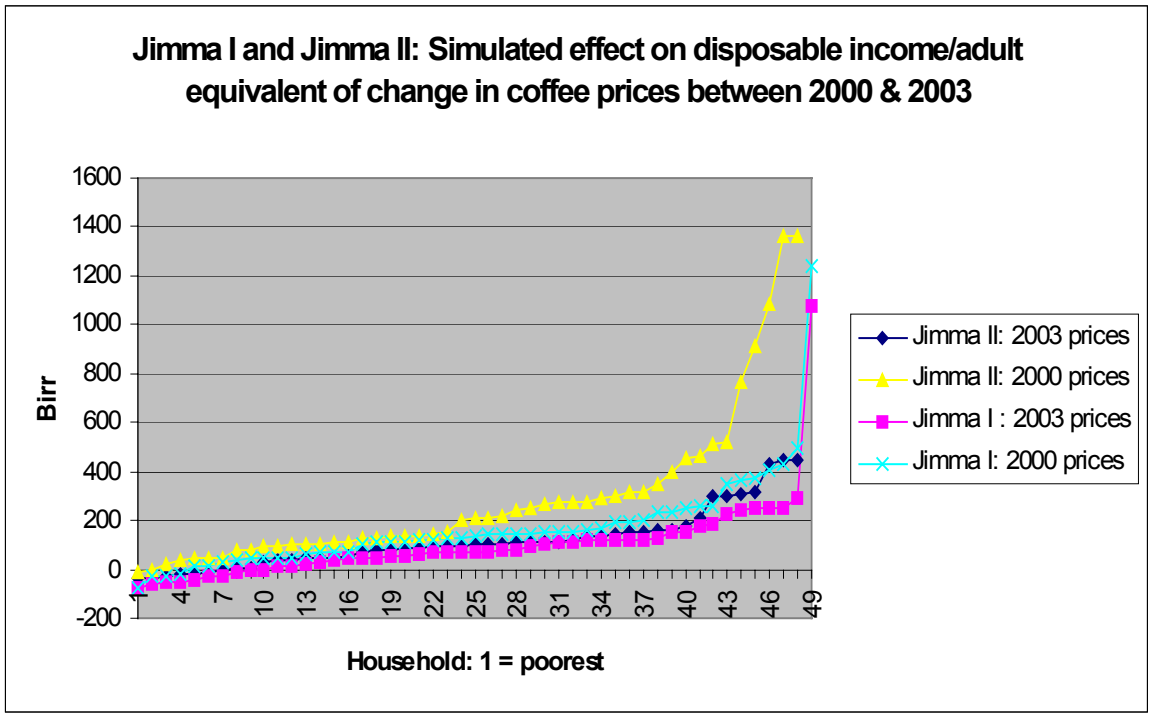


Fig 7. Jimma I and Jimma II. Simulated effect on disposable income/adult equivalent of change in coffee price, 2000/2003



The relationship between changes in coffee price and changes in disposable income

Taking the 2003 prices as a benchmark, disposable income in Jimma I would change by 1.5% and in Jimma II by 0.7 % for each 1% change in coffee price.

8.0 Discussion

This study has used a measure of disposable income and a standard of living threshold to draw comparisons between households and between locations. The impact of changes in coffee price and production have been simulated to demonstrate the impact of price and production changes on disposable income.

The study has highlighted the high level of dependence of both communities on coffee production and the lack of opportunities for marketing other food crops from these areas. The study has used a relatively simple analytical technique to predict the impact of change. The findings of this report raise questions across a range of policy areas. Of most immediate interest are those relating to the relationship between coffee prices, poverty reduction and the problems of income diversification arising from lack of infrastructure and investment.

Save the Children, March 2004

ANNEXE 1

The Model

In this study, household economy methods adapted from methods originally developed at SC UK for famine prediction, (the 'household economy approach') have been used. Famine prediction requires the ability to estimate household 'food entitlement' i.e. the ability of a household to acquire food under changed conditions e.g. of price, production, market access. (Sen, 1981). Knowledge of reduced food production levels, (for example from drought) is not in a reliable or useful predictor as some or all households may (I) not grow crops, or crops that are drought prone (ii) may be able to make up any deficit in production in other ways e.g. by selling assets, falling back on wild foods etc.

The household economy approach was developed to see if it was possible to estimate household entitlement within and between defined populations of different economy (e.g. poor, better-off; cultivating, pastoral) with sufficient accuracy to allow predictions to be made of the likely impact on household economy of production failure and other shocks. To be effective the method also had to

- Produce output in terms that would be convincing to donors and other agencies.
- Be based on clear objectives e.g. to allow for a household to retain livestock and other assets and to maintain some access to non-food goods as well as food.
- Be able to identify possible interventions e.g. market support, which could be used to prevent a food crisis occurring.

The approach developed was therefore based on an economic model, to simulate the most likely outcome of the impact a shock or shocks on household food entitlement. To meet the other operational criteria it was important to keep the model as simple as possible. Put in other terms, the aim was to allow a user to develop a logical, quantified case about the most likely impact of a stated shock on economy at a high level of disaggregation (e.g. the impact on the poor) where the assumptions are explicit, areas of uncertainty are revealed, and where the prediction is open to test e.g. if a prediction is made that people will sell livestock, this, or a fall in livestock prices should be observed.

For famine prediction, information is required on large areas of diverse economy and a simplified data set is used. For each defined population, this includes a household budget and an estimate of household assets, for each of at least three 'typical' wealth groups (poor, middle, rich), with information on access to wild foods and gifts e.g. charity, food and asset transfers between kin. In larger scale applications an understanding of the market in labour, livestock and other goods is required.

The basic simulation is extremely simple i.e. the shock is used to adjust household food and non-food income to reveal the amount of food and cash remaining to the household and therefore (given stated assumptions about non-food costs) the ability of the household to acquire sufficient food. For example, at the simplest level, a household that made 50% of its income from maize cultivation in a baseline year, would, if maize production fell by 50%, suffer a fall of 25% in its income. If the household had maize stocks equivalent to 10% of its annual requirement, this would reduce the deficit to 15%.

In practice, households may produce some of their own food, exchange this for other food items and cash and have multiple employment and other income sources, and the 'shock' may involve multiple changes e.g. to prices and production levels. The basic calculations become very intricate but remain the same.

This approach has proved to be very effective. In all cases where we have some measures of actual outcome (a total of 14 examples) this has been consistent with prediction. The method has been widely used (e.g. by Operation Lifeline Sudan (OLS) in southern Sudan, for the prediction of the recent famine in Malawi), and has been adopted by USAID/FEWSNET and others. The operational effectiveness of the model lies largely in its structure (i.e. the simulation of the actual steps which households can take to preserve their livelihoods); the detail and 'completeness' of the data set, and the relative simplicity of the mathematics.

In this study the same basic model was used, the only difference being that the data is based on a representative sample of individual households and that the output is in terms of the household disposable income/ adult equivalent.

The impact of a change in coffee price on the disposable income of a household is estimated as follows. Taking for example a household of 3.2 adult equivalents which produced all the food it required for consumption and had a total cash income from all sources of 300 Birr of which 50 Birr was from the sale of 25 kg of coffee at the price of 2 Birr/kg

The disposable income/adult equivalent in the reference year would be 300/3.2 = 93.75 Birr.

Assuming that production remained constant, the effect of an increase in the coffee price to 3 Birr/Kg would be to raise total income by (25*1) = 25 Birr. Total income is now 325 Birr i.e. a disposable income/ adult equivalent of 102 Birr . This represents an increase of 7.7%.

If production had in fact fallen and an estimate was available (e.g. a loss of 30% due to pests or disease), this or any other combination of changes permitted by the data available (e.g. changes in input prices, and the prices and production of other commodities) could be included in the estimate.

ANNEXE 2

Food economy zones adjacent to study areas

Goma Woreda:

Mixed farming (zone B)

This livelihood zone is found in lowland areas, in valley bottoms and more agriculturally marginal land. Coffee is grown but not to the extent that it is in zone A (one of the PA's has no coffee). The poorer land and climate conditions mean that landholdings are relatively larger with more dependency on livestock and higher livestock ownership levels than either zone A or C. Maize, sorghum, teff and ensett are all grown. Accessibility to roads and other infrastructure is poorer than zone A but better than zone C. Fruit and horticultural crops are also found. Honey is relatively common.

This is the main area in Goma where people have re-settled from Tigray and Amhara zones in the north of the country. This is as a result of past famine conditions forcing migration as well as government programmes of resettlement.

Cereal dominant (zone C)

This is the highest altitude area in the zone, in the hills and mountains and surrounded by natural forest. Wild forest coffee is found as a result. Less coffee is grown in this area than either zones A or B. Distances to markets and other infrastructure are generally higher than in either of the other zones. Half of the PA's are only accessible by walking for several hours.

Due to the close proximity and availability of natural forests, tree resources are well used. Wildlife hunting and collection of honey take place here. The highest numbers of livestock per household are found in this zone. Mules and horses are more common than in zones A and B. Field crops of maize, sorghum, teff, barley, oil crops, pulses and ensett are more common and the main sources of both food and income in this area.

Mana woreda

Zone B

Coffee is the dominant crop but maize, teff, chat and horticultural crops are also common. Intensive chat production is only common in some villages.

Zones C and D: These zones are quite similar, and are comparable to zone C in Gomma. One of main differences is proximity of C/D in Mana to roads and markets, and greater distance to forest and related products.

Mixed Farming (I): Zone C

Coffee (less than A and B); more crop land than A & B. More livestock than B. Maize, teff, ensett, chat (more than B), horticultural crops (cabbage and potato).
Use coffee for cash income. Sell more of cereal crops. More Horticultural crops than A & B. Not all households have coffee in these PA's. Coffee more recently expanded

Mixed Farming (II) : Zone D

Very low coffee production – only garden coffee. More field crops than all others. Maize, teff, pulses, chat (more than all others), ensett more than others, barley, horticultural crops, highland fruits. Higher altitude area.
More livestock than all other areas – including sheep and horses. Expect land size lower than others. More highly populated.
C & D are quite similar; coffee more recently introduced.

ANNEXE 3

Sources of income

	Jimma I	Jimma II
Coffee	**Coffee sales red**	**Coffee sales red**
	Coffee sales dry	**Coffee sales dry**
		Coffee gleaning
	Coffee harvesting	**Coffee harvesting**
	Coffee trade	
	Coffee sorting	
Chat	**Chat**	**Chat**
	Chat middleman	
Other production	**Honey**	**Sugar cane**
	Cow Milk sales	**Cow Milk sales**
	Cow Live sales	**Cow Live sales**
	Ox/bull Live sales	**Ox/bull Live sales**
	Sheep Live sales	**Sheep Live sales**
	Chicken Egg sales	**Chicken Egg sales**
	Chicken Live sales	**Chicken Live sales**
Employment	**Agricultural labour**	**Agricultural labour**
	Casual labour	**Casual labour**
	Charcoal making	**Sale of firewood**
	Fencing	**Full time trade**
	Roofing	**Full time trade, livestock**
	Construction	**Teff treshing**
	Lumbering etc	**Ensete processing**
	Livestock trade	**Processing plant worker**
	Sewing	**Handicrafts**
	Broker	**Butter making and sale**
	Handicrafts, beehives, sieves etc	**Baked goods sale**
	Leftover coffee sales	**Transporting commodities**
	Spice and herb sales	**Brewing and spirits**
	Injera sales	
	Enset processing and sale	
Gifts		**Food gift, maize**
		Cash gift
Other	**Remittance**	**Remittance**
		Pension
		Rental income

This study forms part of a four-country research programme funded by DfID. The overall goal is to develop methods of measuring and analysing poverty and modelling the impact of change at household level. The focus of this study was on the impact of changes in the global coffee price on household poverty in a coffee producing region of Ethiopia.

For copies of this or other reports in this research programme please contact:

Save the Children
Emergency Policy Team
1 St Johns Lane
London
EC1M 4AR
UK
Tel: +44 (0)20 7012 6801
Fax: +44 (0)20 7012 6964
Email: c.petty@savethechildren.org.uk/
emergencypolicy@savethechildren.org.uk
www.savethechildren.org.uk