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RURAL NON-FARM ACTIVITIES IN IMPOVERISHED AGRICULTURAL COMMUNITIES: THE CASE OF NORTH SHOA ETHIOPIA

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PREFACE

This research is an integral part of the De-agrarianisation and Rural Employment (DARE) Programme of the Afrika Studiecentrum (ASC). De-agrarianisation is defined as a process of economic activity reorientation, occupational adjustment and spatial realignment of human settlement away from agrarian patterns. The clearest manifestations of this process are: a diminishing degree of self-sufficiency in rural household food and basic needs, a decline in agricultural labour effort relative to non-agricultural labour in total national labour expenditure, a decrease in agricultural output per capita in the national economy relative to non-agricultural output and a declining number of people residing in rural areas (Bryceson, 1993).

This study attempts to investigate the extent of de-agrarianisation in North Shoa, one of the most impoverished regions of Ethiopia. A most devastating famine occurred in 1984-85 when more than 100,000 people required emergency assistance.Thereafter food insecurity became a chronic problem in North Shoa because of recurrent drought, massive land degradation (leading to poor soil fertility), sub-economic holdings, and limited use of modern inputs. It is argued that the region's worsening living conditions can only be reversed through a strategy focusing on the development of a dynamic non-farm sector.

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Rural Non-farm Activities in Impoverished Agricultural Communities: The Case of North Shoa, Ethiopia

I. Background

1.1 *The Ethiopian Economy*

The Ethiopian economy is largely agrarian with over 85 per cent of the total employment, 90 per cent of the foreign exchange earnings and nearly 50 per cent of its GDP originating from agriculture. The agricultural sector provides raw materials for more than 70 per cent of the country's industries that are largely engaged in processing agricultural raw materials.

The industrial sector, consisting of medium- and large-scale manufacturing, small-scale industry and handicrafts, electricity and water and construction, contributed 11.7 per cent of the GDP at constant factor cost in 1993/94. Agro-processing constitutes over two-thirds of the medium- and large-scale manufacturing industries. The distribution service (trade, hotels and restaurants as well as transport and communications) and other services (banking and insurance, real estate and ownership of dwellings) accounted for 14.8 and 28.3 per cent of the GDP respectively in 1993/94 (Annex I).

The structure of the Ethiopian economy has shown no significant change over the years. For instance, agriculture's contribution to the total GDP averaged 53.6 per cent during the period 1991/92-1993/94 as compared with 55.3 per cent in 1980/81-1982/83. Another closely related feature is the stagnant performance of the economy. The average annual growth rate of GDP was only 1.6 per cent for the period 1981/82-1990/91, compared to a 3 per cent growth in population.

There are two main systems of arable farming in Ethiopia: the oxen-based, mixed farming (crops and livestock) system and the mainly hoe-based annual, root and perennial crop cultivation system. The mixed farming system is found in the central, northern and eastern parts of the country. The cropping systems vary but cereals, mainly *teff*, wheat, barley, maize and sorghum, are dominant in the region. Hoe-based cultivation is typical in the southern and western parts of the country where the principal crops are coffee and *enset*.[1] Cereals (mainly maize) and various types of root crops are also grown as secondary food crops.

Individual peasant farming is by far the most dominant subsector, accounting for over 97 per cent of the agricultural output. The share of state and cooperative farms has declined from about 8-9 per cent under the previous regime to less than 3 per cent.

The farm size of a typical farm household is very small, only about 0.8 ha on average, and nearly 80 per cent of peasant sector production is destined for home consumption and seed. Over the last two decades, yield levels have stagnated at about 1 ton per hectare, one of the lowest in the world. Agricultural output has failed to keep pace with

[1] The root of *enset* provides food in the form of starch and the stem is used to produce coarse fibre. *Enset* provides more foodstuff per unit area than most cereals.

population growth. For instance, the production of cereals, pulses and oilseeds (temporary crops) in 1991-92 was around 5.6 million tons, compared to 6.5 million tons in 1980-81. This represents a 14 per cent decline in production as opposed to an increase in population of over 40 per cent over the same period (1980/81-1991/92) (Annex II).

The poor performance of agriculture has resulted in widespread poverty, chronic food insecurity and a growing reliance on international donors for food consumption. The estimated per capita calorie intake has fallen below 80 per cent of the level considered necessary for a healthy life. Food aid requirements are estimated to vary from 500,000 metric tons in a good production year to 2.8 million metric tons in a bad year. It is estimated that some 60 per cent of the population lives below the absolute poverty line. More importantly, the incidence of poverty is much more widespread in rural areas owing mainly to bad weather, diminishing farm sizes and land degradation (USAID/Ethiopia, 1995).

A number of factors have contributed to the weak performance of agriculture in Ethiopia. Restrictive policies, drought and environmental degradation and population pressure are among the major bottlenecks in the development of agriculture. The former military government attempted to run a centrally planned economy which stifled private initiative. The 1975 land reform proclamation ended private ownership of land by making all land state property. Transfer of land by sale, lease, mortgage or similar means was made illegal. Cultivation of land outside one's village of residence was forbidden. Except through government sponsored schemes, rural-rural migration (seasonal or otherwise) was severely restricted. Attempts were made to transform the peasant agriculture through producers' cooperatives designed along socialist principles. Public investment and institutional credit in agriculture were directed towards the expansion of collective and state farms whose combined contribution to the total agricultural output seldom exceeded 6 per cent (Brune, 1990). Over 50 per cent of the government budget was used on the civil war and for the maintenance of internal security. It should be noted that the institutional and policy environment has improved following the overthrow of the military government in May 1991 by the EPRDF forces and the establishment of a Transitional Government of Ethiopia (TGE).[2]

Drought constitutes the biggest threat to production in many parts of Ethiopia. Severe weather fluctuations have made rural life extremely precarious. The ability of the farming community to feed itself has progressively declined and crop failure has taken its toll in the 'Great Famines' of 1973/74, 1984/85 and 1993/94. Damage due to declining soil fertility has equally threatened agricultural production. An estimated 1,900 million tons of soil is being eroded annually from the highlands, sharply reducing soil fertility and yield.

Rapid population growth has resulted in holdings which are too small and fragmented, thus reducing labour productivity and causing widespread underemployment.

[2]The TGE has initiated a reform programme which introduced a transition from a command to a market economy, economic stabilisation, and structural adjustment. However, it will take several years before the new policies bear fruit and the ill-effects of the old policies are fully reversed.

Over 65 per cent of holdings are below one hectare in size and are cultivated only once a year. Rural unemployment and underemployment, which is estimated at 25-40 per cent, is aggravated by the growing problem of landlessness. Scarcity of land has become a critical point of constriction in many highland areas and youthful household members are increasingly losing access to land.

Reduced access to land and declining farm size would not necessarily translate into underemployment and poverty if non-farm activities could provide alternative employment opportunities. A dynamic non-farm sector could provide employment in its own right and stimulate agricultural production by providing important farm inputs.

1.2 *Non-farm Activities in Ethiopia*

Traditionally, rural cottage and handicraft industries in Ethiopia have produced various goods both for own consumption and for markets. A wide range of products including utility items such as clothing, plough shares, spearheads, knives, leather garments, footwear, basketwork, etc., as well as artistic and other luxury items are produced for decorative and ceremonial uses. Traditional crafts covered almost all the demand for manufactured goods in the country at least until the beginning of this century.

Few studies have as yet been made on non-farm business activities in Ethiopia. The first and last survey of rural business and handicraft industries was carried out 25 years ago (in 1972-73) by the Central Statistical Office (CSO, 1975). The survey, which covered all administrative regions except Eritrea and nomadic *awrajas* and *woredas* (districts/subdistricts), estimated the total number of household enterprises engaged in cottage and handicraft industries at 209,825 (Table 1). About 60 per cent of these household enterprises (125,929) derived the larger share of their income from non-farm activities. Farming constituted a major source of income for the remaining 83,896 households (40 per cent).

Of the 209,825 household enterprises, 146,742 (69.9 per cent) were engaged in textile production including clothing. Within the textile industry, 83,507 enterprises (56.9 per cent) were engaged in weaving, 51,501 (35.1 per cent) in spinning and 9,921 (6.8 per cent) in tailoring. Bakery products, *injera* making and local drinks together accounted for 2.4 per cent of total household business establishments. The manufacturing of pottery and similar products was undertaken by 18,304 enterprises (8.7 per cent). About 4.1 per cent (8,553 establishments) were engaged in the production of cutlery, hand tools, general hardware and related products (see Table 1).

The total number of persons engaged in the 209,825 household enterprises was found to be 245,077. On average, each enterprise employed 1.2 persons, almost all of them being unpaid family workers. Only 295 of the 245,077 workers (0.1 per cent) were paid employees. In general, most enterprises are characterised by self-employment with only one person operating the establishment. The average value of output and value added

per household enterprise is only Eth$168.46 and Eth$74.97 respectively (see Annex III for total output and value added).

The geographical distribution of rural manufacturing showed a high degree of concentration in five provinces, namely Shoa (25.2 per cent), Begemider (now Gondar) (14.6 per cent) Gojjam (13.0 per cent), Sidama (now Sidamo) (19.0 per cent) and Wollo (12.5 per cent) (Annex III). These regions together accounted for 84.3 per cent of the total rural cottage and handicraft establishments. The other provinces, namely Arssi, Bale, Gamu Gofa, Hararghe, Ellubabor, Keffa, Tigre (now Tigray) and Wollega accounted for only 15.7 per cent.

Table 1: Total Number of Household Enterprises and Number of Persons Engaged by Industry Group, 1972-73

Industry Group	Total number of household enterprises	Total number of persons engaged
Slaughtering, preparing & preserving meat	984	2,484
Grain mill products	4,184	4,331
Bakery products	418	418
Injera making	548	608
Other local drinks	3,982	4,072
Spinning	51,501	56,005
Weaving	84,507	99,663
Spinning, weaving, finishing textiles	382	382
Knitting	927	927
Cordage, rope, twine, sacks	366	732
Ready-made garments	138	138
Tailoring of textiles	9,921	10,240
Tanneries & leather products	5,170	7,138
Manufacturing of fur & fur products	295	590
Furniture & fixtures, except metal	3,608	3,740
Other wood products	181	181
Manufacturing of pottery, china and earthenware	18,304	22,036
Cutlery, hand tools & general hardware	5,432	6,752
Fabricated metal products n.e.c.	3,121	3,121
Manufacture of products n.e.c.	16,856	21,519
Total	209,825	245,077

Source: Provisional Military Government of Ethiopia, CSA, *Advance Report on the 1972-73 Rural Survey of Cottage and Handicraft Industries, Addis Ababa*, April 1975.

The rural labour force in Ethiopia in 1972-73 can be estimated at 11 million (excluding Eritrea and the nomadic *awrajas* and *woredas*). The proportion of the rural labour force engaged in cottage and handicraft activities could be thus roughly estimated at 2.2 per cent. This proportion is low compared to other African countries where non-farm

activities are a primary source of employment for 10-20 per cent of the rural labour force and provide 25-30 per cent of total income.[3]

The 1984 Population and Housing Census contained limited information on non-farm activities. According to the census, the proportion of the economically active rural labour force engaged in agriculture and animal husbandry was 96.7 per cent. Non-agricultural activities accounted for only 2.9 per cent of the economically active population.[4] Within the non-agricultural group, 'sales workers'[5] and 'production-related workers'[6] were the most dominant. The two occupational categories together accounted for 2.4 per cent of the total economically active rural population or 76 per cent of the population engaged in non-agricultural activities. The proportion of persons engaged in 'professional and technical' and 'service work' was given as 0.3 and 0.2 per cent respectively.

In 1987-88, the Central Statistical Authority (CSA) conducted the Rural Labour Force Survey which provided information on the size of non-farm activities. It estimated the percentage of those economically active in non-farm activities as 6 per cent. This is more than twice the proportion given by the 1984 census (2.9 per cent). There is a significant difference between the two reports with respect to the proportion of women engaged in certain occupational categories. For instance, women engaged in agriculture and animal husbandry accounted for 11.3 per cent in the survey but only 4.7 per cent in the census report. According to the 1987-88 Rural Labour Force Survey, a higher proportion of the female labour force participated in the 'production related' non-farm category (8.6 per cent), mainly due to the large number of female food and beverage processors. By contrast, only 1.3 per cent were engaged in the same trade according to the 1984 census. Given the short period separating the two statistical reports (only 3 or 4 years), it is not clear why such significant differences emerged.

1.3 *Objectives of the Study*

Agriculture is unlikely to absorb all the new entrants into the labour market without declining land holdings and corresponding declines in per capita incomes. In this regard, non-farm activities need to be vigorously promoted if they are to offer real opportunities for the creation of alternative sources of employment outside agriculture.

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[3] Although non-farm activities are poorly developed in Ethiopia, the definition adopted in the 1972/73 survey may have also resulted in the low rate of participation. The survey covered only cottage and handicraft industries, narrowly defined as enterprises producing manufactured goods primarily for sale. Service-rendering and commercial activities (e.g. trade) were not included.

[4] The occupational category of the balance 0.4 per cent is not stated.

[5] Sales workers are those working as managers of trade enterprises, working proprietors, sales supervisors and buyers, salesmen, etc.

[6] Production-related workers are production supervisors, miners, quarrymen, metal processors, wood and paper workers, chemical processors, spinners, knitters, weavers, tanners, tailors, shoemakers, wood workers, food and beverage processors, blacksmiths, toolmakers, electrical workers, plumbers, metal workers, etc.

The overall objective of this study is to investigate the process of non-farm activities in one of the most impoverished regions of Ethiopia, North Shoa. More specifically, the research intends to:

- describe the role and trend of farm activities and output;
- investigate the trends in income diversification as well as the historical evolution of non-farm activities;
- examine the relationship between farm and non-farm activities with particular focus on the extent to which income diversification is associated with an increase or decrease in agricultural productivity and income; and
- identify the major constraints to non-farm activities and suggest a policy framework for the development of these activities.

1.4 *Methodology*

Primary data generated through the DARE survey is the main source of information for the study.[7] The survey was conducted in North Shoa between February and April 1995. Three districts, namely Debre Berhan Zuria, Ankober and Gera Medir *woredas* were selected with the aim of capturing the effects of differences in crafting tradition, agricultural potential and marketing opportunities on non-farm activities.

Three Peasant Associations (PAs) were randomly selected in each district, i.e. 9 PAs in total. The 9 PAs were Genet, Chole and Wshwushegne from Debre Berhan, Alyu Amba, Laye Gorbella and Cheffa from Ankober, and Tsehay Sina, Sina Amba and Dose from Gera Medir.[8]

A total of 268 households, 101 from Debre Berhan, 92 from Ankober and 75 from Gera Medir were randomly selected and a minimum of 30 households were interviewed from all but one PA (Gera Medir). Different statistical techniques including regressions are used for analysing the data.

II. Literature Review

2.1 *Definition of Non-farm Activities*

Off-farm activity includes all secondary and tertiary sector employment of both a permanent and casual nature. Since the activities in this area are quite diverse, a number of different terms are used in the literature to refer to off-farm employment. For instance, rural industrialisation, as a counterpart to agriculture, is widely used. But this appears rather narrow as most activities are not strictly of an industrial nature but of a service orientation. Rural enterprise is also seen to have a sufficiently non-farm connotation. This term is also

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[7] The survey is an integral part of the De-agranisation and Rural Employment (DARE) Program of the Afrika Studiecentrum (ASC).

[8] Debre Berahn has 51 PAs under its administration, while Ankober and Gera Medir have 85 and 43 PAs respectively.

inadequate since the characteristics are not exclusive to non-farm activities. Many of the activities (e.g. traditional crafts) are not enterprises but are part-time activities and a source of additional (principal or secondary) income to agriculture.

Broadly speaking, non-farm activities in rural areas can be divided into the following categories (ILO/JASPA, 1991):

- small-scale industrial activities such as food processing (e.g. flour milling, oil processing, soap making, food processing);
- cottage industries (e.g. handicrafts, spinning of cotton or wool, cloth weaving and dying, pottery, leather tanning and distilling local brews);
- artisanal activities (e.g. blacksmithing, masonry, woodwork/carpentry, house construction, repair services and fabrication of farm tools);
- commercial activities (e.g. trading and transportation);
- infrastructural development activities (e.g. special public works, feeder roads and irrigation works, and food-for-work programmes); and
- formal employment including professional administrative and clerical work

2.2 *The Relationship between Farm and Non-farm Activities*

Studies on non-farm employment have focused on factors affecting the development of the sector. One important issue relates to whether the demand for these activities increases or decreases as rural incomes increase. Hirschman (1958) contended that the linkages between rural industrial activities and agriculture are quite weak. Hymer and Resnick (1969) have argued that rural industrial activities produce inferior goods, and thus the demand declines with an increase in rural income. By tracing the decline of rural industry in Burma, the Philippines and Thailand from 1870 to 1938, Resnick (1970) provides empirical evidence for the contention that rural industrial and other non-farm activities decline and opportunities for trade increase.

A number of contributors more recently, however, indicate that rural industrial and other non-farm employment and output have been increasing with development, rather than decreasing. For instance, Johnston and Kilby (1975), Mellor (1976), King and Byerlee (1978), Chuta and Liedholm (1979) and ILO (1972) have shown that there is a strong, positive relationship between income and the demand for these activities. Chuta and Liedholm (1984) concluded that the available evidence indicates that the linkages between rural industries and agriculture are quite important. Rural industries are influenced by the pattern of agricultural growth and can themselves influence the course and rate of agricultural development. They also explained that Hirschman perceived few linkages because he implicitly used a two-sector model in which all rural activities are labelled 'agriculture' and because he was writing in the context of a technologically stagnant agriculture.

Increased demand associated with rising farm income leads to the diversification of the local economy and a growth of jobs in non-farm activities. Hence, in order to promote

broad-based rural development, priority should be given to the agricultural sector with the aim of raising farm incomes, from which all else will follow (Mellor, 1976). Raising farm labour productivity is important not only because it permits the release of labour from agriculture to non-agricultural pursuits, but also because it boosts per capita income to levels that enable consumer diversification from food into non-food items (Haggblade *et al.* 1987).

On the other hand, studies have shown that the percentage of non-farm income to total income tends to be high in arid and semi-arid zones where cropping income is risky (e.g. the Sahelo-Sudanian zone of Niger, Botswana and western Sudan) or where land to labour ratios are low due to high population pressures (e.g. Rwanda). Declining farm income is compensated for by increased participation in non-farm activities. Within the same country, the shift to non-farm income also tends to be intensified in drought years (Tesfaye, 1994). In Indonesia, it has been noted that participation in other sectors is minimal in areas where agriculture can provide a reasonable living for most of the population. Where agriculture cannot do this - as in Java - people make or supplement their living by intensive participation in non-farm activities (UNDP *et al.* 1988).

Income diversification can be positively related to income in a growth-mediated environment where consumption and production linkages are well developed. The share of farm income declines with an increase in income level since the rural population shifts into high productivity on high-wage non-farm activities but the pattern tends to reverse in an environment where growth is depressed. The share of non-farm income rises in the face of a declining total income. Poor households diversify into low-paying activities. The failure of agriculture to absorb the growing labour force in productive employment spurs the process of diversification. Consequently, it is hypothesised that there is a U-shaped relationship between the share of non-farm income and income level (Tesfaye, 1994).

Studies on the relationship between farm size and off-farm income have reported an inverse relationship [e.g. Anderson and Leiserson (1980) on Pakistan, Thailand and South Korea; Shand and Chew (1986) on Malaysia; Ho (1986) on Taiwan]. For instance, Ho (1986) demonstrated that in rural Taiwan, although off-farm activity increased for all farm size groups, the share of off-farm employment is considerably higher for smallholdings of less than 0.5 ha than for farms of over 2.0 ha. In Malaysia, Shand and Chew (1986) reported that the off-farm share of total income stood at 70 per cent for smallholdings of less than 0.5 acres but was only 21 per cent for farms over 5 acres.

The long-term impact of off-farm diversification on agricultural production is a contentious issue. It is argued that diversification has an adverse effect on farming in situations where off-farm activities compete with agriculture for scarce resources. Labour is diverted away from farming in a manner that reduces optimal intensity and skill. For instance, in Taiwan, households that earn around 80 per cent of total income from off-farm sources have an average yield that is only 57 per cent that of households with an off-farm income of less than 20 per cent of total income (Ho, 1986). By contrast, some studies have

suggested that rising income from non-farm employment makes it easier for households to accept risks associated with innovation and thus enables farm households to raise levels of productivity and output in agriculture. For instance, Evans and Ngau (1991), using farm-level data from Kenya, concluded that not only the amount of non-farm income revenue but also the number of sources of non-farm revenue are important in providing the household with a sense of financial security that enables them to undertake the additional risks necessary to become more productive farmers. It is also possible for the decline in family labour to be compensated for (or even more than compensated for) through hiring labour with the money earned from non-farm employment.

The equity effect of off-farm income in levelling disparities between families of different land holding status has been widely explored. The growing contribution of off-farm income, particularly for the smallest land holding groups, has been very important in Japan and Taiwan. The overall distribution of rural family income improved considerably as a result of non-farm employment. Micro-level evidence from Sri Lanka also showed that in some cases tenant farmers had been successful in securing higher family earnings than owner operators through the more effective exploitation of off-farm opportunities (Slater, 1991). Shand (1986), on the other hand, accepts that off-farm earnings have generally led to a substantial reduction in rural inequality, but qualifies the overgeneralisation of this phenomenon. He points out that off-farm activities improved the distribution of income in Thailand in only two of the four provincial samples. His own study in Malaysia also showed little improvement in the distribution of income.

Rural non-agricultural development has become a key component of China's development strategy. The government wants to shift rural workers from agriculture to non-agricultural activities, but wants to achieve this with only a limited amount of rural-urban migration. The slogan is 'Leave the land but not the countryside; enter the factory but not the city'. The policy is to transform agriculture from self-sufficient and semi-self-sufficient production to large-scale commodity production. This involves increases in farm size and a substantial share of the agricultural population moving out of cultivation. Private undertakings in small industries, handicrafts, commercial food and beverages, services, transport, etc. are encouraged (UNDP *et al.* 1988).

The growth in part-time farming and off-farm opportunities in Taiwan have been greatly facilitated by the country's decentralised industrial structure. The 1971 industrial census showed that 50 per cent of all manufacturing employment was located outside the main urban centres, accounting for 48 per cent of manufacturing value added. The development of a highly productive smallholder agricultural system (consolidated by the 1949-53 land reforms and various rural development programmes) also created a vigorous market for non-food products, thus facilitating the growth of domestic manufacturing and location-specific services (e.g. furniture, furnishings, clothing. etc.) (Ho, 1979)

Table 3: Level of Education (percentage)

Type of Education	Debre Berhan			Ankober			Gera Medir			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Traditional/ religious	1.2		1.0	5.8		5.4	6.0		5.3	4.2		3.7
Adult literacy	67.4	60.0	66.3	75.6	66.7	75	49.3	87.5	53.3	65.3	69.0	65.7
Elementary	7.0	6.7	6.9	4.7	16.7	5.4	22.4		20.0	10.5	6.9	10.1
High School	8.1		6.9	3.5		3.3	10.4		9.3	7.1		6.3
Illiterate	16.3	33.3	18.8	10.5	16.7	10.9	11.9	12.5	12.0	13.0	24.1	14.2
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 4: Number of Household Heads by Primary Occupation (percentage)

Occupation	Debre Berhan			Ankober			Gera Medir			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Farm work	93.0	66.7	89.1	97.6	71.4	95.7	92.5	37.5	86.7	94.5	60.0	90.7
Herding	0	0	0	0	0	0	1.5	0	1.3	0.4	0	0.4
Domestic work	0	26.7	4.0	0	14.3	1.1	0	50.0	5.3	0	30.0	3.4
Too old to work	4.7	6.7	5.0	1.2	0	1.1	3.0	0	2.7	2.9	3.3	30.0
Non-farm work	2.3	0	2.0	1.2	14.3	2.2	3.0	12.5	4.0	2.1	6.7	2.6
Total	100	100	100	100	100	100	100	100	100	100	100	100

Farming is the most important occupation of the household heads. It is reported as the primary occupation by 90.7 per cent of the household heads. One respondent claimed herding as his major job. Those who reported domestic work as their main occupation accounted for 3.4 per cent, while 3.0 per cent were too old to work. Only 8 household heads (2.6 per cent) reported non-farm activities as their major occupation (Table 4).

The 268 households have a total of 1,511 family members (including the head), thus giving an average family size of 5.6. The average family size is higher in Debre Berhan and Ankober (5.9) than in Gera Medir (5.0). The age distribution of family members shows that 34.8 per cent are below the age of 10 and another 25.3 per cent are between the ages of 11 and 20 (Table 5).

Table 5: Distribution of Household Members by Age (percentage)

Age Group	Debre Berhan	Ankober	Gera Medir	Total
0 - 10	32.0	32.6	42.4	34.8
11 - 20	28.0	27.2	18.0	25.3
21 - 30	10.6	10.7	18.7	12.6
31 - 40	9.9	10.4	9.9	10.1
41 - 50	9.2	7.4	5.1	7.5
51 - 60	6.0	6.3	3.7	5.6
61 - 70	2.9	4.4	1.3	3.0
71 and over	1.3	0.9	0.8	1.1
Total	100	100	100	100
Average family size	5.91	5.90	5.01	5.66

IV. The Farm Economy and its Implications for the Non-farm Sector

Like any other community in highland Ethiopia, mixed farming is the mainstay of the households in the study area. Farmers only grow food grains, largely barley, wheat, teff and various types of pulse crops and oilseeds. There are almost no perennial or cash crops in the region. Livestock production constitutes a major part of the mixed farming system, providing draft power, producing meat and milk, and serving as an important source of cash income. This section describes the farming activities which are categorised as crop and livestock production and briefly examines the implications for the development of the non-farm sector.

4.1 *Crop Production*

4.1.1 *Land*

The average holding size is 2.3 hectares for the study sites, with significant variations between the three sites. It is largest in Debre Berhan (3.4 ha) followed by Ankober (1.7 ha) and Gera Medir (1.4 ha). The average size of land under field crops is 1.67 ha (73.6 per cent of the total holdings) for all sites, 2.4 ha for Debre Berhan, 1.4 ha for Ankober and 1.0 ha for Gera Medir (Table 6). Land allocated for grazing, garden crops, fallow and forest constituted 13.2, 6.6, 4.0 and 2.6 per cent, respectively. Forest land is less than 0.1 ha in all three sites.

Over 60 per cent of the land cultivated by individual households is less than 1.5 hectares in the survey areas. For Gera Medir, farm sizes are much smaller; about 77 per cent of the farmers cultivate less than 1 hectare of land. Those who cultivated more than 2 hectares constituted less than 3 per cent in Gera Medir. By contrast nearly 60 of the households in Debre Berhan cultivate more than 2 hectares of land.

The majority of the sample households (63.4 per cent) classified their land as semi-fertile *(lem-tef)*, while 31 per cent described it as infertile *(tef)*. Only 5.6 per cent reported cultivating fertile land *(lem)*. None of the farmers in Gera Medir classified their land as fertile, reflecting the poor or marginal agricultural potential of the area. The proportion of farmers reporting fertile holdings was 13 per cent in Ankober and only 3 per cent in Debre Berhan (Table 6).

The tenure system is dominated by owner cultivators. All but two households had their own land for cultivation. In addition, land is acquired through sharecropping and renting. Sharecropping was reported by 37 households in Debre Berhan, 22 in Ankober and 8 in Gera Medir. The number of households reporting renting land was 8 in Debre Berhan, 5 in Ankober and 9 in Gera Medir.

Table 6: Average Holding Size, Tenure Type, Soil Fertility and Size Distribution in Ha.

	Debre Berhan	Ankober	Gera Medir	Total
Land use				
cultivated farm land	2.44	1.35	1.02	1.67
garden land	0.26	0.05	0.12	0.15
forest land	0.07	0.06	0.03	0.06
grazing land	0.49	0.14	0.24	0.30
fallow land	0.16	0.07	0.03	0.09
Average holding size	3.42	1.66	1.44	2.27
Tenure type (cultivated land)				
average cult. land	2.44	1.35	1.02	1.67
owned: mean size	1.96	1.15	0.88	1.38
rented: mean size	0.12	0.07	0.07	0.09
	(8)	(5)	(9)	(22)
sharecropped: mean	0.35	0.10	0.07	0.19
size	(37)	(22)	(8)	(67)
Soil fertility (%)				
not fertile	45.55	15.22	30.67	31.0
semi fertile	51.49	71.74	69.33	63.4
fertile	2.97	13.04	0.0	5.6
Size dist. (%)				
1 ≤ 0.5	0.00	9.52	18.57	8.33
0.51 - 1.0	7.14	41.67	58.57	32.94
1.1 - 1.5	17.35	27.38	11.43	19.05
1.6 - 2.0	27.55	8.33	8.57	15.87
2.1 - 2.5	14.29	5.95	1.43	7.64
2.6 - 3.0	13.27	3.57	1.43	6.75
3 >	20.41	3.57	0.00	9.13

Note: Figures in brackets are reporting households.

4.1.2 *Use of Draft Animals*

Land preparation is carried out with the wooden plough and a pair of oxen. The land is ploughed several times (3-4 times in the case of cereal crops) before planting. Seeds are also covered by ploughing with a pair of oxen. Oxen are used for threshing as well.[11]

Farmers without oxen constituted 18 per cent in the study sites. Those with one ox accounted for 28 per cent and two oxen 49 per cent. Farmers with three or four oxen were only 3 and 2 per cent of the total respectively. The proportion of farmers with no ox or only one is highest in Gera Medir (81.3 per cent).

Over half of the reporting farmers (mainly those with no or only one ox) have encountered draft power problems with the problem being more serious in Gera Medir (81 per cent) than in Ankober (42 per cent) or Debre Berhan (39 per cent). A combination of different measures are used to overcome the problem. Most farmers facing oxen shortages relied on labour-oxen exchange (78 per cent) and/or assistance from relatives (76 per cent). *Mekenajo* or the teaming up of households with one ox is reported by 58 per cent of the households and oxen hiring by 2 per cent (Table 7).

Table 7: Use of Draft Animals

	Debre Berhan	Ankober	Gera Medir	Total
Distribution of oxen owned				
0	12.87	9.87	36.00	18.28
1	15.84	27.17	45.33	27.99
2	59.41	61.96	18.67	48.88
3	6.93	1.10	0.00	2.99
4	4.95	0.00	0.00	1.87
HHs report'g oxen problems (%)	39.39	42.22	81.33	52.30
Measures used to overcome the problem (allowing multiple esponses) (%)				
(a) oxen-exchange	53.85	73.68	50.82	57.97
(b) assistance from relatives	84.62	60.53	80.33	76.09
(c) labour-oxen exchange	87.18	71.05	75.41	77.54
(d) oxen hiring	5.13	2.63	0.00	2.17

The introduction of an improved plough could significantly reduce the oxen time (as well as labour time) required for land preparation. This also allows the possibility of diversifying oxen use for non-farm activities such as grain and oil milling as well for rural transport.

[11] Threshing is carried out by animal trampling.

4.1.3 *Use of Labour*

All agricultural operations require heavy manual work. Because of the primitive technology, ploughing requires a lot of energy and is an exhaustive task largely done by men. Weeding and harvesting (using sickles) are entirely done by hand and both men and women participate in these operations. All forms of transport, including journeys to and from the market, are heavily dependent on human labour. Carrying goods on one's head (for males) and one's back (for females) is more common than animal transportation in North Shoa as there are no animal-drawn carts in the area.

The average household size is 5.7 for the entire sample. It is lower in Gera Medir (5.0) than in Debre Berhan and Ankober (5.9) (Table 8). Assuming that persons between the age of 10 and 70 take part in productive activities in rural areas and that this age group accounts for 60 per cent of the population, each household can potentially engage at least 3 family members in farm work.

A shortage of labour is reported by 32 per cent of households. The problem is relatively more serious in Debre Berhan (44 per cent), reflecting the larger holding sizes in the area, than in Ankober (28 per cent) or Gera Medir (20 per cent). Most farmers who reported labour shortages used traditional labour exchange and support arrangements such as *debbo* and *wonfel* (63 per cent). Some 39 per cent used hired labour to work on the farm, mainly harvesting and weeding. None of the farmers in Gera Medir reported having hired labour (Table 8).

Leisure time seems to be significant in the study areas as over 80 per cent of the farmers do not work on some 8 saints' days of the month and nearly 100 per cent refrain from working on Saturdays and Sundays (Table 8). There are also many other saints' days and holidays observed by a number of farmers. It is estimated that, on average, about 15 days of the month are non-working holidays. There is a strict religious belief that working on these days could result in punishment by God. Crop failure due to rain or disease is often attributed to punishment by God for working on religious holidays.

Table 8: Patterns of Labour Use

	Debre Berhan	Ankober	Gera Medir	Total
Faced labour shortage (% Yes)	44.00	27.48	20.27	31.70
Measures taken to overcome the shortage (allowing multiple responses) (%)				
a) hired labour	53.90	23.30	0.00	38.90
b) used traditional labour exchange arrangement (Debbo, Wonfel)	52.17	88.46	53.33	63.20
Holidays and saint's days on which no farm work is done (%)				
Saturday (weekly)	100.0	98.91	100.0	99.63
Sunday "	100.0	98.91	100.0	99.63
Abo (monthly)	61.39	44.57	64.0	56.34
Selassie "	80.20	73.91	100.0	83.58
St. Michael "	100.0	94.57	98.65	97.39
Egziabeher "	90.10	43.48	40.0	60.08
St. Gabreal "	83.17	95.65	96.0	91.05
Kidane Miheret "	55.45	95.78	81.33	64.18
St. Mary "	100.0	98.91	100.0	99.63
St. Giorgis "	98.02	97.83	97.30	97.39
Holy Saviour "	80.02	85.87	97.33	86.6
Bale Wold "	98.02	98.91	100.0	98.88

4.1.4 *Use of Commercial Inputs or Tools*

Farming practices in North Shoa require limited cash outlay. Traditional farm tools are locally made by farmers themselves without any cash expenditure. Ploughs are largely made of wooden materials, with only the small iron tips and plough harness connections being made by local blacksmiths. The iron tip costing about Birr 15-20 and the plough harness connection Birr 5-7 are bought only once in three or four years. The annual repair and maintenance costs of such tools do not exceed Birr 5. The cost of other tools such as a hoe or an axe is much lower.

Labour hiring for cash occurs mainly in the case of families with labour problems (e.g. due to old age or female-headed households).[12] The practice of hiring or renting draft animals for cash is not common.

[12] In areas with high agricultural potential such as Arssi and East Shoa, rich farmers have emerged. They rent land from poor farmers and use hired labour to undertake the different farming activities. There are no such farmers in the study area because of its weak agricultural potential.

The use of commercial fertilisers is limited mainly to Debre Berhan. Some 68 per cent of the sample farmers in the area reported having used fertilisers during the last cropping season. Fertiliser-using households numbered only 8 (10.7 per cent) in Gera Medir and 23 (25.0 per cent) in Ankober. The average fertiliser purchase (for all sample households) was 163, 13, and 4 kg in Debre Berhan, Ankober and Gera Medir respectively. Improved seeds were used by 7 per cent in Debre Berhan, 11 per cent in Ankober and 35 per cent in Gera Medir. The higher use rate in Gera Medir is attributed to the free distribution of improved seeds by World Vision (one of the NGOs operating in Ethiopia) following the 1993 drought. Seeds for planting come from a farmer's own previous harvest. No farmer in Gera Medir reported having used herbicides or insecticides, compared to their limited use in Ankober and Debre Berhan (Table 9).

Table 9: Use of Non-traditional Inputs

	Debre Berhan	Ankober	Gera Medir	Total
Fertilisers				
(a) used fertilisers (% yes)	68.32	25.0	10.67	37.31
(b) average per HH (kg)				
DAP	132.61	6.52	1.33	52.59
urea	30.45	6.79	2.67	14.55
Total fertilisers (Kg)	163.05	13.32	4.00	67.14
Used improved seeds (% yes)	7.0	10.87	34.67	16.10
Used weed-killers (% yes)	1.98	6.52	0.00	3.00
Used pesticides (% yes)	6.93	8.79	0.00	5.60

4.1.5 *Output, Yield and Constraints*

The mean annual crop output[13] per household (for both *meher* and *Belg* seasons) is 7.2 quintals. Grain output is highest in Debre Berhan (10.9 quintals), followed by Ankober (6.3 quintals) and Gera Medir (3.3 quintals) (Table 10).

Crop yields are generally low in the study area. The average output of barley per hectare is only 5.7 quintals for *meher* and 5.3 quintals for *belg*. Yield levels for wheat are 3.6 and 3.4 quintals for *meher* and *belg* seasons respectively. Teff is cultivated during the *meher* season only and the average yield is 4.2 quintals per hectare.

Yield variation between the three sites is significant. For instance, barley yield is 5.9 quintals per hectare in Debre Berhan, 5.0 quintals in Ankober and 2.7 quintals in Gera Medir. The overall average grain yield per hectare is 3.9 quintals for *meher* and 5.1 quintals

[13] Total output is obtained by a simple summation of all the different crops. The method has no serious problem for Debre Berhan and Gera Medir where the cropping pattern is similar and *teff* cultivation (a high value crop) is not important. *Teff* is important in Ankober and this has resulted in a slight underestimation of the total output.

for *belg*. Overall grain yield levels are relatively high in Ankober, with 6.0 and 4.4 quintals for *belg* and *meher* seasons respectively. Farmers in Debre Berhan do not have *belg* crops, and the average yield for *meher* is only 3.9 quintals per hectare. In Gera Medir, yield rates are 4.1 and 3.0 quintals during the *belg* and *meher* seasons respectively.

It should be pointed out that the yield level in Debre Berhan is very low (in fact the overall yield is lower than in Ankober) when viewed against the high level of fertiliser use in the area. This may suggest that fertiliser alone does not contribute to higher yields in North Shoa.[14]

Table 11 shows the amount of revenue obtained from crop sales. The mean revenue amounted to Birr 52.45 for all sites. It varied from Birr 75.66 in Debre Berhan to 10.91 in Gera Medir or to 60.25 in Ankober. A total of 15 households (14.9 per cent) in Debre Berhan, 23 (25 per cent) in Ankober and 14 (18.7 per cent) in Gera Medir did not sell any grain. As many as 68, 55 and 61 households obtained less than Birr 100 from crop sales. None of the sample farmers in Gera Medir received more than Birr 100.

Table 10: Mean Output and Yield of Crops Cultivated (land in hectares, output in kg) by Agricultural Season

	Meher				*Belg*			
	Debre Berhan	Ankober	Gera Medir	Total	Debre Berhan	Ankober	Gera Medir	Total
Barley								
Land	1.03	0.22	0.03	0.48	0.00	0.29	0.35	0.2
Output	609.14	109.10	7.99	274.08	0.00	188.25	147.47	106.78
Yield	591.40	495.91	266.33	571.00	0.00	649.14	421.34	533.90
Wheat								
Land	0.57	0.05	0.33	0.32	0.00	0.02	0.02	0.01
Output	221.29	7.99	105.17	115.57	0.00	7.50	2.74	3.35
Yield	388.23	159.80	318.70	361.16	0.00	375	137	335
Teff								
Land	0.01	0.24	0.01	0.09	0.00	0.00	0.00	0.00
Output	0.00	107.28	2.67	37.58	0.00	0.00	0.00	0.00
Yield	0.00	447.0	267	417.56	0.00	0.00	0.00	0.00
Total								
Land	2.77	0.94	0.60	1.55	0.00	0.36	0.38	0.23
Output	1086.17	411.57	178.26	602.51	0.00	216.91	154.25	116.79
Yield	392.12	437.84	297.10	388.72	0.00	602.53	405.92	507.78

[14] A package of inputs consisting of fertilisers, improved seeds and chemicals as well as improved cultural practices may be required for a substantive increase in yield levels.

Table 11: Revenue from Crop Sales

	Debre Berhan	Ankober	Gera Medir	Total
Mean revenue	75.66	60.25	10.91	52.45
Distribution (%)				
no revenue	14.9	25.0	18.7	19.4
1-100 Birr	67.3	59.8	81.3	68.7
101-200 Birr	10.9	4.3	0.0	5.6
201 and above	6.9	10.9	0.0	6.3

Household interviews and group discussions with farmers revealed that output and yield levels have sharply declined over the years. The main constraint to production is declining soil fertility as identified by 94 per cent of the sample households. Massive land degradation (due to erosion) has reduced soil fertility and the top soil has been almost completely washed away in Gera Medir, leaving behind stony farm land. Diminishing farm size, low and erratic rainfall, growing incidences of crop pests and diseases, excessive rains and weeds were given as serious problems by 89, 78, 51, 46 and 41 per cent of the farmers respectively. In Gera Medir, poor soil fertility, declining farm size and shortage of rain were observed as major constraints to agricultural production by 100, 96 and 93 per cent of the farmers respectively (Table 12).

Table 12: Major Constraints to Agriculture (percentage reporting)

	Debre Berhan	Ankober	Gera Medir	Total
Poor soil fertility	93.0	90.2	100.0	94.0
Shortage of land	84.0	88.0	96.0	88.8
Shortage of rain	69.3	75.0	93.3	78.0
Pests	54.6	54.4	41.9	50.9
Excessive rain	52.5	40.2	44	45.9

Holding sizes have declined over the years because of population pressure. Older farmers (during the group discussions) noted that when land was plentiful in the past, everyone practised fallowing or soil burning to maintain soil fertility and yield levels were relatively higher. With population growth though, the practice of fallowing was abandoned.[15] Soil burning was often practised on fallowed land to increase productivity. According to the household survey, fallowing and soil burning (*guy*) is currently practised by only 3.4 and 4 per cent of the respondents (Table 13). Although 76 per cent of the respondents reported having used manure, much of it was in fact applied to garden crops or

[15] Small holdings have meant that all available land must be cultivated and it is not possible to leave the land idle for fallowing purposes.

plots around the homestead. The use of manure is limited since animal dung is the main source of fuel throughout the region. In addition, its supply has declined because of the decline in the number of livestock (see Section 3.2). The use of non-traditional inputs like fertiliser is also limited (especially in Gera Medir and Ankober) as mentioned in Section 4.1.2. More importantly, fertiliser alone may not contribute to higher yields as demonstrated by the low level of yield in Debre Berhan in spite of the relatively higher rate of fertiliser use there.

Table 13: Use of Manure, Fallowing, Soil Burning and Irrigation (percentage reporting yes)

	Debre Berhan	Ankober	Gera Medir	Total
Used manure	88.12	69.23	68.92	76.3
Used irrigation (garden crops)	10.31	6.52	1.33	6.4
Used				
(a) fallowing	3.96	1.09	5.30	3.36
(b) soil burning	9.09	1.09	0.00	4.11

4.2 *Livestock*

Animals are fed on communal and/or private grazing land which is often degraded because of overgrazing or overstocking. Forage supplies from such degraded and unimproved pasture land is very low. Crop residues (such as straw) are an important source of animal feed in the area but the forage intake is often below the maintenance requirements of the animals. One member of the household (usually a boy) is committed to cattle herding.

The average number of cattle (including oxen, cows, bulls, heifers and calves) owned is 3.7. The corresponding figures for Debre Berhan, Ankober and Gera Medir are 4.8, 3.8 and 2.0 respectively. The mean number of sheep and goats is 5.5 in Debre Berhan, 3.1 in Ankober and 5.2 in Gera Medir. The respective average number of pack animals owned is 2.0, 1.2 and 0.7 (Table 14).

The average earnings from livestock sales were Birr 423.8 for all sites. It is highest in Debre Berhan (Birr 581.30) followed by Gera Medir (Birr 363.59) and Ankober (Birr 297.76). The sale of livestock products (mainly butter, milk, hides and skins) generated an average cash revenue of Birr 41.05 in Debre Berhan, Birr 42.39 in Gera Medir and Birr 19.48 in Ankober (Table 14).

A decreasing trend in the ownership of livestock is observed for all groups of animals. The number of oxen, cows and sheep owned has declined for 57, 51 and 56 per cent of the respondents respectively. An increasing number was reported by only 9-15 per cent, and no change by 14-24 per cent of the sample households (Table 14). The increasing cases largely apply to young families who have recently formed their own households.

The single most important constraint in livestock production is a shortage of grazing land as indicated by 97 per cent of the respondents. Growing population pressure has resulted in the expansion of cultivated land at the expense of pasture land. Other problems included a lack of breeding stock (75 per cent), disease (59 per cent), shortage of water (35 per cent), predatory animals (22.9 per cent) and theft (19.2 per cent) (Table 15). In Gera Medir, the number of sheep raised by each household has sharply declined because of disease.

Table 14: Average Livestock Ownership

	Debre Berhan	Ankober	Gera Medir	Total
Cattle including oxen (mean no. owned)	4.84	3.82	2.04	3.71
Sheep and goats (mean no.)	5.53	3.05	5.20	4.59
Pack animals (mean no.)	1.97	1.17	0.69	1.34
Ownership trends (%) in:[16]				
oxen				
decreasing	58.8	56.0	56.0	56.7
increasing	16.2	20.8	5.3	15.3
no change	22.1	18.4	30.7	22.8
cows				
decreasing	51.5	49.6	52.0	50.7
increasing	13.2	12.0	6.7	10.8
no change	25.0	23.2	25.3	24.3
sheep				
decreasing	73.5	44.0	61.3	56.3
increasing	11.8	12.0	1.3	9.0
no change	5.9	16.0	17.3	13.8
Average income from livestock sales	581.30	297.76	363.59	423.84
Average income from sale of livestock products	41.05	19.48	42.39	34.02

16 Because of missing cases, the column totals may not add up to 100 per cent.

Table 15: Major Problems of Livestock Raising (percentage reporting)

	Total
Shortage of grazing land	97.0
Lack of breeding animals	72.8
Disease	59.0
Water shortage	35.3
Wild animals	22.9

4.3 *Implications for the Non-farm Sector*

According to group discussions, all those wanting to become farmers (especially youngsters or newly formed households) have very limited access to land. The past policy which guaranteed access to land for all rural residents above the age of 18 (through the reallocation of land by PA officials) has been disallowed under the new economic policy of the Transitional Government. Access to land through rent or sharecropping is not always available. More importantly, such arrangements usually involve cases where the renter or the sharecropper has his/her own land and is capable of cultivating more land (i.e. he/she can raise all the necessary inputs such as labour, oxen and seeds as well cash to cultivate the additional land). The household offering land for rent or sharecropping is poor and often without labour, oxen or seeds for planting. Hence, youngsters who normally have labour but do not own land, oxen and seeds cannot get land through rent or sharecropping. For some families a solution is sought in sharing holdings with their married sons, leading to further fragmentation and diminishing farm sizes. Consequently, the number of landless or near landless or underemployed/unemployed is on the rise, especially among the youth.

The land problem and the low level of farm income clearly underscores the need to create employment opportunities outside agriculture. Attempts to absorb the growing rural labour force in the agricultural sector alone would only exacerbate poverty and the ecological crisis.

Given the small farm sizes, growing landlessness and the large number of non-working days (due to holidays), labour cannot be a constraint in the development of the non-farm sector in the study area. The high literacy rate (86 per cent) may also create a favourable environment for promoting employment-generating schemes.

However, the low level of agricultural development suggests limited linkages with non-farm activities. Widespread use of commercial inputs and improved farming tools is lacking in Ethiopia in general and in the study area in particular. The few commercial inputs currently used by farmers are largely imported from abroad and agricultural operations mainly require simple tools made from local materials. Imported fertilisers and chemicals cannot generate strong linkages or growth multipliers in the local economy. The small iron tips and the plough harness connections are made by local blacksmiths. Agricultural activities generally have little or no backward linkages with manufacturers of farm tools in

Ethiopia. Nor are the forward linkages any more developed. Food processing is largely a household female activity. In many cases, even milling grain into flour is done manually at home using a stone grinder. There is virtually no market for processed food items such as bread or *injera* in the study areas. The only case of grain processing observed in the survey area is brewing and/or distilling local drinks (see Section 5.2).

Processing animal products can increase a farmer's income. For instance, milk processing can significantly improve the income of dairy farmers. The absence of such processing plants in the study area has meant that farmers can only extract butter from milk using inefficient traditional techniques. Apart from some crude forms of tanning around Debre Berhan and home-made wool yarning in Gera Medir, attempts to process animal products are largely non-existent.

V. Characteristics of Non-farm Activities

It has been documented that non-farm activities are critical survival strategies offering cyclical and seasonal employment to supplement meagre farm incomes in many drought prone areas of Africa. The off-farm economic activities found in the study area include traditional crafting, the sale of food and drinks, trading, engagement in wage employment and various other sources of income.

5.1 *Traditional Handicrafts*

There are a number of crafting activities in which farmers in the study area can potentially participate. These include weaving, pottery, tannery (limited to Debre Berhan), blacksmithing, tailoring, and carpet making. Craft workers produce iron tips for plough, knives, simple chisels, axes, earthenware water and cooking pots, clothes, and leather garments for the rural community. Nonetheless, the rate of participation and income derived from handicraft activities by the sample households is very low: the number of households participating, on a part-time basis, in weaving, pottery, blacksmithing, tannery and other types of crafting was 4, 2, 2, 5 and 6, respectively. In the total sample of 268 households, only 19 sample households (7.1 per cent) reported having augmented their farm income through such means. The rate of participation in crafting was 10 per cent in Debre Berhan, 5.4 per cent in Ankober and 5.3 per cent in Gera Medir (Table 16).

The average annual income derived from handicraft activities in reporting households was Birr 316.47. There is a slight variation between the sites with Birr 384.94 in Gera Medir, 308.05 in Debre Berhan, and 278.40 in Ankober. Less than Birr 100 of average income was derived from crafting by 5 of the 19 households (Table 16).

According to the group discussions and household interviews, the importance of crafting activities has decreased over the years. The major problems are government restrictions, the high price of raw materials, low demand because of poverty or low

incomes, competition from factory-made products, low productivity and a lack of improved equipment and tools. The traditional sheep wool carding system practised in Gera Medir has resulted in low quality carpets and mats. The high price of yarn, combined with the other problems like low purchasing power, has made weaving products less competitive. Many farmers believe that they can get more income from farming, however unproductive the soil may be, than from traditional handicraft activities.[17]

Carpet and mat making in Gera Medir is also hampered by a lack of markets. The respondents (during the group discussions) revealed that there are no buyers for carpets in the local market. The marketing cooperative once organised by the farmers to sell carpets in Addis Ababa or Debre Berhan failed after the elected official disappeared with the cooperative's money. While the farmers have almost entirely stopped the practice, a number of households in the nearby town of Mehal Meda make a living from full-time carpet and mat making using home-woven wool yarn from local farmers.

Table 16: Rate of Participation and Income from Handicrafts (in Birr)

	Debre Berhan	Ankober	Gera Medir	Total
Total no. of households	10	5	5	20
weaving	2	1	1	4
pottery	-	1	1	2
blacksmithing	-	1	1	2
tannery	5	-	-	5
others	3	2	1	6
Rate of participation (%)	10.0	5.4	5.3	7.1
Mean income of reporting households	308.05	278.40	384.93	316.47
Distribution (%)				
no income	90.1	94.6	94.7	92.9
Birr 1-100	4.0	1.1	0.00	1.9
Birr 101 and above	5.9	4.3	5.3	5.2

5.2 *Sale of Local Drinks*

A total of 67 households (25 per cent of the sample farmers) reported having earned income from the sale of local brews (*araki* and *tella*). The level of participation is highest in Debre Berhan (33.7 per cent) followed by Ankober (29.3 per cent) and Gera Medir (8 per cent) (Table 17). The average annual income earned by the reporting households was Birr 980.92. It amounted to Birr 1,451.40 in Debre Berhan, Birr 561.64 in Ankober and Birr 201.63 in Gera Medir.

[17] See Section 7 for a more detailed discussion of the major constraints

Since its introduction to the region some 40 or 50 years ago, *araki* has rapidly gained popularity. It is widely consumed by both the rural and urban population, especially around Debre Berhan. *Araki* is prepared by women using barley as the main raw material and many single women in urban areas are also engaged in selling the drink.

The main problems in selling local brews are the increasing price of barley, cumbersome distilling processes, a competitive market caused by the involvement of too many women in the trade, and a lack of capital for starting a business. The market for local brews is limited in Gera Medir probably because of the low purchasing power of the inhabitants as well as a low level of urbanisation when compared to Debre Berhan. In recent years, the profitability of the activity has been further reduced as the sale and transportation of *araki* has been subjected to taxes imposed by the local government.

Table 17: Rate of Participation and Income from the Sale of Local Brews (in Birr)

	Debre Berhan	Ankober	Gera Medir	Total
No. of households participating	34	27	6	67
Rate of participation (%)	33.7	29.3	8.0	25.0
Mean income of reporting households	1451.4	561.64	201.63	980.92
Distribution (%)				
no income	66.3	70.7	92.0	75.0
Birr 1-100	2.0	0.0	1.3	1.1
Birr 101 and above	31.7	29.3	6.7	23.9

5.3 *Trade*

Only 12 households (4.5 per cent of the sample farmers) reported income from trading activities. Of these 11 were from Debre Berhan, 1 from Ankober and none from Gera Medir. The rate of participation in trade is 10.9 per cent for Debre Berhan, compared to 1.1 per cent in Ankober and none in Gera Medir (Table 18). The average annual earnings for reporting households is Birr 351.57 in Debre Berhan.

Commercial activities used to be an important source of income for farmers in the study area according to the group discussions. There were several part-time trading farmers who bought various consumer items such as salt, pepper, spices, coffee, and clothes from outside the area and sold them to the local community. Food grains were also bought from surplus areas and sold in deficit areas.[18] The long-distance trade involved places like Sidamo, an area over 400 kms from Debre Berhan, in the case of the coffee trade. Pack animals such as mules and horses played an important role in transporting goods. Such trade was widely practised until restrictions by the military government made it illegal for

[18] Full-time traders were rare in traditional Ethiopia.

farming households to engage in trade and other non-farm activities. This, together with the emergence of full-time traders in urban areas, reduced the role of commercial activities in the area.

Farmers reported that the new economic policy had not brought much change. Participation in trade is still constrained by several factors: the lack and/or high costs of vehicle transport, a shortage of capital for starting a business, restrictions due to permit or licence requirements, check-point *(kella)* charges, and the low purchasing power of the community. These problems have reduced the profitability of trading. Although the policy of the former government which prohibited farmers from engaging in non-farm activities has been lifted, new restrictions such as licence requirements and *kella* charges have adversely affected the incentive to engage in trade.

Table 18: Rate of Participation and Income from Trade (in Birr)

	Debre Berhan	Ankober	Gera Medir	Total
No. of households participating	11	1	-	12
Rate of participation (%)	10.9	1.1	-	4.5
Mean income for reporting HHs	351.57	2000.08	0.0	488.88
Distribution (%)				
no income	89.1	98.9	100.00	95.5
Birr 1-100	1.0	0.0	1.3	0.4
Birr 101 and above	9.9	1.1	0.0	0.4

5.4 *Participation in Wage Employment and Food-for-Work Schemes*

Prior to the 1975 land reform, seasonal wage employment provided a critical source of income for many landless and near landless farmers in North Shoa. According to the group discussions, poor farmers had access to different types of local employment opportunities such as farm work, construction work in urban areas and seasonal migration. Relatively better-off households, especially those residing in urban areas, hired seasonal labour for farm work. Men were employed to do tasks such as ploughing, threshing, building walls and fences, while both men and women were hired for weeding and harvesting. Women were also hired for grinding grain and spinning cotton into yarn. Payment for daily work was often made in kind, cash or food or some combination of the two. Young boys typically worked as shepherds and girls as domestic servants in return for food, shelter and a small annual wage.

Seasonal employment in nearby urban areas was common. Construction work was a major source of employment for rural labour before 1975 and seasonal migration to commercial farms in the Awash valley and coffee growing areas also absorbed a number of rural workers.

Opportunities for wage employment declined sharply after the 1975 reforms largely due to nationalisation measures and restrictive wage and employment policies. The 1975 land reform, which nationalised all rural lands, banned the use of hired labour and disallowed non-cultivating and non-resident ownership of land. Seasonal migration ceased almost completely as private economic activities were severely curtailed both in urban and rural areas.

New forms of employment were created under the military government. In food-deficit areas, including North Shoa, a new form of employment opportunity, i.e. a food-for-work programme, was introduced in the mid 1980s. The work involved road construction, terrace building, construction of soil and stone bunds, check-dam construction, gully control and afforestation. The establishment of service cooperatives in rural areas also created limited employment opportunities. The cooperatives, which were established to provide marketing services in the area of inputs, outputs and consumer goods, as well as to undertake small enterprises such as flour mills, hired shop assistants, cashiers, guards, etc. from the rural community. Since the early 1990s, the restrictions on hiring labour have also been removed.

A total of 75 households (28 per cent) have participated in wage employment and food-for-work schemes in the study area. The rate of participation was highest in Gera Medir (54 per cent), followed by Ankober (28.3 per cent) and Debre Berhan (7.9 per cent) (Table 19). All the employment in Gera Medir was due to the food-for-work scheme operating in the area. The scheme provides a critical source of income for the most destitute households. There were no reported cases of individual households hiring labour in Gera Medir, a reflection of the low level of agricultural productivity. Sources of employment in Ankober are food-for-work schemes, service cooperatives operating flour mills and stores, and individual farms. All the reported employment cases in Debre Berhan were in the form of wage work on individual farms.

Daily wage rates (for farm work) varied with the type of agricultural operation and seasons. In Debre Berhan, the wage rates are about Birr 3 per day for weeding and Birr 5 per day for harvesting. In addition, the employer is expected to provide lunch for the worker. The rates are lower (e.g. Birr 3 for harvesting) in Ankober. Some farmers in Gera Medir reported that they would work for even Birr 1 if given the opportunity.

The average annual income earned by the reporting households was Birr 597.82. The level of income amounted to Birr 871.84 in Ankober, Birr 480.93 in Gera Medir and Birr 306.28 in Debre Berhan.

> Among the major problems of wage employment are limited job opportunities. With the exception of food-for-work, all the other employment opportunities have declined over the years. The capacity to hire labour has declined because of diminishing farm sizes and falling incomes.

Table 19: Rate of Participation and Wage Income (in Birr)

	Debre Berhan	Ankober	Gera Medir	Total
No. of households participating	8	26	37	75
Rate of participation (%)	7.9	25.7	40.2	28.0
Mean income of reporting HHs	306.28	871.84	480.93	597.82
Distribution of income (%)				
no income	92.1	71.7	45.3	72.0
Birr 1-100	1.0	0.0	5.3	1.9
Birr 101 and above	6.9	28.3	49.3	26.1

5.5 *Other Non-farm Income*

Over 61 per cent of the respondents (164 households) have secured income from various other non-farm activities ranging from the sale of animal dung (as firewood), to support from relatives and friends. The number of households reporting income from these sources was 79 (78.2 per cent) in Debre Berhan, 41 (44.6 per cent) in Ankober and 44 (58.7 per cent) in Gera Medir (Table 20).

A total of 76 households earned income from the sale of animal dung and wood as fuel mainly in Debre Berhan, 45 from *iqub* or rotating saving associations, 35 from the sale of home-made wool yarn (only in the case of Gera Medir), 27 from the sale of hay and other animal feed and 22 households from taking out loans (Annex IV).

The mean annual income from other non-farm activities for reporting households was Birr 431.95. The corresponding figures for Debre Berhan, Ankober and Gera Medir were Birr 447.16, 496.89 and 345.82 respectively. Earnings were more than Birr 200 for most of the participating households (59 per cent).

Table 20: Rate of Participation and Income from Other Non-farm Activities (in Birr)

	Debre Berhan	Ankober	Gera Medir	Total
No. of households participating	79	41	44	164
Rate of participation (%)	78.2	44.6	58.7	61.2
Mean income	447.16	496.89	345.82	431.95
Distribution of income (%)				
no income	21.8	55.4	41.3	38.8
Birr 1-100	13.9	9.8	9.3	11.2
Birr 101-200	20.8	7.6	12.0	13.8
Birr 201 and above	43.6	27.2	37.3	36.2

5.6 *Relative Share of the Different Non-farm Activities*

Table 21 shows the percentage share of the five different categories in total non-farm earnings. The largest contributor is the revenue from the sale of drinks in Debre Berhan (52.5 per cent) and wage income in Ankober (36.8 per cent) and Gera Medir (52.4 per cent). Wage incomes are entirely derived from food-for-work employment in Gera Medir. It has also a significant share in Ankober. The second most important source is the 'other non-farm' category. This item mainly refers to the sale of animal dung (as firewood) and hay (for animal feed) in Debre Berhan, earnings from *iqub*, firewood sales and credit in Ankober, and revenue from home-made wool yarn in Gera Medir (see Annex IV for details). The contribution of trade and handicraft activities is the largest share (36.7 per cent) in the study area.

Table 21: Non-Farm Income by Source (percentage share of all sample households)

	Debre Berhan	Ankober	Gera Medir	Total
Revenue from handicraft activities	3.28	2.26	4.09	3.11
Revenue from sale of drinks	52.46	24.62	3.22	34.00
Wage income	2.60	36.80	52.43	23.20
Revenue from trade activities	4.11	3.25	0.00	3.04
Other non-farm income*	37.55	33.07	40.26	36.65
Total	100	100	100	100

Note: * This category is composed of several items and the relative importance of each varies from one site to another (see Annex IV for details).

VI. Determinants of Non-farm Income and Participation

Several factors are postulated to influence the decision regarding participation in non-farm employment. These factors can be broadly grouped into five categories: (1) personal attributes; (2) farm income; (3) farm attributes; (4) food balance (defined as grain sales less grain purchase); and (5) access to urban markets.

6.1 *Hypotheses*

It is hypothesised that personal attributes such as age, sex, family size and education are important determinants of non-farm income.

- Older farmers are expected to be less active and hence rely more on farm than on non-farm income. The variable *age* (defined as the age of the household) is expected to have a negative coefficient.

- Brewing local drinks to sell is commonly performed by female-headed households. Women have more time for non-farm activities as they often do not take part in ploughing activities. Female-headed households are thought to earn more non-farm income than men. The variable *sex* refers to the sex of the household head (male = 1, female = 0) and it is expected to have a negative coefficient.
- Access to information and opportunities increases with education. The variable *education*, measured by the number of grades completed, is hypothesised to have a positive influence on non-farm income or participation.
- The larger the family size the greater the pressure is to increase income in order to ensure the subsistence requirements of the family. *Family size* is expected to have a positive coefficient.
- The level of *farm cash income* is hypothesised to be positively correlated with non-farm income in the study areas. Farm cash earnings are thought to ease financial constraints in operating non-farm activities. The level of *farm income* (approximated by the sum of the revenue from crops and livestock, including livestock products, sales) is expected to have a positive coefficient.
- Farm attributes refer to factors which suggest that the farmer gives more attention to farming than to non-farming activities. For instance, some studies (e.g. Ho, 1986) suggest that agricultural productivity is negatively correlated with non-farm income. Higher agricultural productivity implies that the farmer devotes more of his/her time and resources to the farm. Agricultural productivity is approximated by *yield* (defined as total output per hectare) in this study and it is expected to have a negative coefficient. The second factor which is hypothesised to influence resource allocation between farm and non-farm activities is oxen ownership. Ownership of a pair (or more) of oxen is thought to encourage more farm work than otherwise. Hence, households with a shortage of oxen are thought to have no time constraint in engaging in non-farm work. *Oxen* (defined as a dummy variable with 1 for those with 2 or more oxen and 0 otherwise) is expected to have a negative coefficient. The third factor considered under farm attributes is land endowment. Consistent with the above argument, the land endowment of the farmer is expected to have a negative impact on non-farm income. Land endowment is approximated by *holding size* (which includes cultivated, garden, grazing and forest land).
- Given the fact that the region is generally known as food deficient and the overriding objective of the farmer is to meet food requirements, it is

hypothesised that *food balance*, defined as food grain sold less food grain purchased) is negatively related to non-farm income.

- A dummy variable, *access to an urban centre*, with 1 for Debre Berhan and 0 otherwise, is used to capture the effect of the larger urban centre on non-farm income. It is hypothesised that access to the Debre Berhan (the largest urban centre in the study area) improves opportunities for engaging in non-farm activities. The dummy variable is expected to have a positive coefficient.

6.2 *Results and Discussion*

6.2.1 *Determinants of Non-farm Income*

The results of the regression model are given in Table 22. The dependent variable is defined as the amount of cash income earned from non-farm activities (Model A) and the percentage share of non-farm income in the total cash earnings of the family (Model B).

Personal Attributes

The variable *age* has come out positive but insignificant in Model A. The age of the household head does not seem to have a strong influence on non-farm income. However, the coefficient is negative and significant in Model B, suggesting that the share of non-farm income (in total cash income) declines with age. Older farmers tend to rely more on their crops and livestock husbandry than on non-farm earnings.

As anticipated, the coefficient of *sex* is negative in both equations. The evidence suggests that female-headed households generally devote more time to non-farm activities and hence earn more non-farm income than their male counterparts. Female-headed households, which are generally claimed to attain lower agricultural output and productivity, because of their labour problems and limited access to productive inputs,[19] appear to participate more in the sale of drinks and other non-farm activities, including the sale of home-made wool yarn (Gera Medir) and firewood (animal dung).[20]

Consistent with the hypothesis, *education* has a positive coefficient in both models. By and large, the evidence supports the general belief that education has a favourable impact on non-farm income. It would appear to improve rationality and stimulate a diversified use of resources in marginal areas such as North Shoa.

The variable *family size* has insignificant coefficients. Such results do not support the view that the more intense the subsistence pressure the greater the tendency will be to diversify sources of income.

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[19] See for instance, Dejene Aredo, *Female-Headed Farm Households in Two Contrasting Regions in Ethiopia: Access to and Management of Resources,* CERTWID/IDR/AAU, Dec. 1994, Addis Ababa.

[20] See subsection (b) below.

Farm Cash Income

The coefficient of *farm cash income* is positive but insignificant in Model A. It appears that earnings from non-farm activities do not increase with an increase in farm income. The role of farm income in financing non-farm activities is not significant in the study area.

The coefficient of *farm cash income* is negative and significant in equation B. The share of non-farm income declines with an increase in farm income. Households with higher levels of farm income have a lower share of non-farm income in their total cash income, perhaps because engagement in non-farm activities declines once a certain level of farm income has been achieved. Non-farm employment seems to serve as a survival strategy for poorer households rather than as a commercial activity practised by better-off farmers.

Farm Attributes

The coefficient of *yield* is negative in both and significant in one case (Model B). As expected a higher yield suggests that a farmer has been less involved in non-farm activities. Similarly, the ownership of a pair of oxen or more is associated negatively with non-farm income as evidenced by the negative coefficient of the *oxen* variable. Households lacking a pair of oxen cannot be fully employed on their farm during the long land-preparation season. It is possible that non-farm activities are performed by such families on the days when oxen are not available through arrangements such as labour-oxen exchange, teaming up *(mekenajo)* or relative/friend assistance.[21]

Holding size has the unexpected positive and significant coefficient in both equations. The larger the area of land owned, the greater the level of income that is derived from non-farm sources. Smaller farm holders surprisingly earn less non-farm income. It is possible that the land variable may capture the effect of other factors such as the asset or capital position for undertaking non-agricultural work. The positive coefficient may imply that households with more resources show greater participation in non-agricultural employment.

Food Balance

As expected, *food balance* has a negative and significant coefficient in all the equations. As far as non-farm participation is concerned, farmers who are net sellers of grain are less interested than net buyers. This is consistent with the view that the interest in participating in non-farm activities declines once the food requirements of the family are satisfied. The result also reinforces the above argument that non-farm activities are survival strategies adopted by poor farmers rather than commercial activities undertaken by better-off farmers.

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[21] For instance, those with one ox team up with those owning one ox to form a pair. A pair is thus formed by two families which is then used every other day by each party. This means each family could possibly engage in non-farm work every other day.

Locational (Market) Advantage

The dummy variable *access to an urban market* has the unexpected negative, and in the case of Model B, a significant coefficient. The explanation for this result may lie in the type of non-farm activities in the study area. The products and services produced by the rural non-farm sector are inferior goods, which cannot withstand competition from the relatively more modern urban-based enterprises. In the absence of any programme to modernise the rural non-farm sector, it is possible that access to an urban market can have a negative impact.

Table 22: Linear Regression Results

Variable	Model A	Model B
Age	1.82	-0.29*
	(0.33)	(-1.70)
Sex	-481.04**	-15.52**
	(-2.09)	(-2.17)
Education	144.07*	2.67
	(1.93)	(1.15)
Family size	31.26	0.48
	(0.92)	(0.46)
Farm cash income	0.16	-0.04***
	(1.29)	(-9.56)
Yield	-0.02	-0.01*
	(-0.15)	(-1.82)
Holding size	236.34***	8.33***
	(3.93)	(4.47)
Number of oxen	-23.37	-8.59*
	(-0.16)	(-1.84)
Food balance	-0.92***	-0.01*
	(-6.90)	(-1.89)
Access to urban market (Dummy variable with 1 for Debre Berhan)	-255.76	-10.19*
	(-1.52)	(-1.95)
Constant	-7.98	82.73***
	(-0.02)	(6.33)
N	246	246
R^2	0.29	0.36
R^{-2}(adjusted)	0.26	0.33
F ratio	9.81***	13.15***

Note: T-Values are given in bracket.

Model A - Dependent variable is the amount of non-farm income earned
Model B - Dependent variable is the share of non-farm income in the total cash income
*** significant at 1% level of significance
** significant at 5% level of significance
* significant at 10% level of significance

6.2.2 *Factors Influencing Participation in Non-farm Activities*

The results of the logit regression for the determinants of participation in different non-farm activities for the three sites are given in Tables 23 to 25. The dependent variable is a binary variable which takes the value of 1 for households participating in the activity and 0 for non-participating. The two most important activities were chosen for the analysis in each case: the sale of drinks and firewood in Debre Berhan, the sale of drinks and wage employment in Ankober, and wage employment and the sale of home-made wool yarn in Gera Medir. The results are broadly similar to that of the linear regression analysis.

The logit regression for participation in local drinks is given in Model A of Table 23. The goodness of fit (i.e. ways to assess whether or not the model fits the model) is measured by the level of correct prediction rate and the chi-square test. Overall, the first model (Model A) correctly classified 73 per cent of the 100 households into two groups: participating and non-participating in the activity under consideration. Incorrect classification occurred only in 27 per cent of the cases. Although the chi-square is not significant, the variable *sex* is significant and it has a negative coefficient. As expected, the probability of participating in the sale of drinks is higher for females than males. Other variables are not significant though most have the expected signs.

Model B of Table 23 reports the logit regression for the sale of animal dung in Debre Berhan. The overall correct prediction rate is 69 per cent and the chi-square is significant. *Farm cash income* has a negative and significant coefficient, implying that the probability of participating in the sale of animal dung decreases with increase in farm income. It appears that only poor families with insufficient farm income tend to take part in this particular activity. *Family size* and *education* have positive and significant coefficients. The larger the family size, the higher the probability is of participation in the sale of animal dung. The probability of participation also tends to increase with education. *Sex* has a negative, though insignificant, coefficient.

Table 24 pertains to the participation in the sale of drinks and wage employment in Ankober. The level of correct prediction is 77.8 per cent in the first model and 73.3 per cent in the second. The chi-square is also significant in the first equation (model A). *Food balance* has the expected negative and significant coefficient in both models A and B. The probability of participating in the sale of local drinks and wage employment is spurred by the need to meet subsistence requirements. Households with a relatively better food supply situation tend to show a lower degree of participation. In other words, participation in brewing/distilling drinks and wage employment (including food-for-work) is largely a response to make good the shortfalls in food production.

The results of the logistic regression for Gera Medir are given in Table 25. With regard to participation in home-made wool yarn (Model A), the level of correct prediction is 71.2 per cent, the chi-square is significant, and four variables have significant coefficients: *age, sex, education* and *farm cash income*. The positive coefficient of *age* implies, in contrast to our hypothesis, the likelihood of participation increasing with age. It is not clear

why age is positively related with this particular activity. As expected, sex has a negative coefficient. The probability of participation is greater for female-headed households than for male-headed households. While education has the expected positive influence, the negative coefficient of *farm cash income* suggests that the probability of being engaged in the sale of wool yarn declines with farm income.

The logit analysis for participation in food-for-work (wage employment) in Gera Medir is given in Model B of Table 25. The chi-square is not significant but the level of correct prediction is relatively high at 73 per cent. The coefficient of *family size* is negative and significant and this is not consistent with our hypothesis.

Table 23: Logistic Regression for Determinants of Participation in the Sale of Drinks & Animal Dung (firewood) (Debre Berhan)

Variables	Model A		Model B	
	Coefficient	Sign. level for Wald Statistic	Coefficient	Sign. level for Wald Statistic
Age	0.0247	0.2580	0.0076	0.7173
Sex	-1.5776**	0.0223	-0.2526	0.7076
Education	0.3230	0.2135	0.4609*	0.0621
Family size	0.0725	0.5619	0.2606**	0.0387
Farm cash income	0.0003	0.3224	-0.0010***	0.0079
Food balance	-0.0003	0.4737	0.0005	0.2181
Farm size	0.0641	0.7223	0.2707	0.1687
Constant	-2.1721	0.1667	-2.3778	0.1184
Chi-square	10.6550	0.1544	16.874**	0.0182
% correct predictions	73		69	
Number of observations	100		100	

Note: Model A is the logistic regression for participation in the sale of drinks
Model B is for participation in the sale of animal dung

*** significant at 1% level of significance
** significant at 5% level of significance
* significant at 10% level of significance

Table 24: Logistic Regression for Determinants of Participation in the Sale of Drinks & Wage Employment including Food-for-Work (Ankober)

Variables	Model A		Model B	
	Coefficient	Sign. level for Wald Statistic	Coefficient	Sign. level for Wald Statistic
Age	0.0228	0.3213	-0.0207	0.3472
Sex	-0.6934	0.4982	0.8640	0.4785
Education	0.4891	0.2037	0.3774	0.3100
Family size	-0.1546	0.2335	-0.0358	0.7782
Farm cash income	-0.0004	0.6392	0.0002	0.7291
Food balance	-0.0063***	0.0005	-0.0026*	0.0832
Farm size	0.2403	0.4097	-0.1605	0.5704
Constant	-2.2428	0.2733	-1.3236	0.5125
Chi-square	21.919***	0.0026	9.086	0.2465
% correct predictions	77.78		73.3	
Number of observations	90		90	

Note: Model A is the logistic regression for participation in the sale of drinks
Model B is for participation in wage employment including food-for work.

*** significant at 1% level of significance
** significant at 5% level of significance
* significant at 10% level of significance

Table 25: Logistic Regression for Determinants of Participation in the Sale of Home-made Wool Yarn & Food-for-Work (Gera Medir)

Variables	Model A		Model B	
	Coefficient	Sign. level for Wald Statistic	Coefficient	Sign. level for Wald Statistic
Age	0.0983***	0.0071	-0.0021	0.9385
Sex	-2.0805**	0.0375	0.2076	0.8027
Education	1.5515***	0.0006	-0.2651	0.4139
Family size	0.2266	0.2683	-0.3536*	0.0512
Farm cash income	-0.0025**	0.0308	-0.0005	0.4745
Food balance	0.0034	0.2214	3.61E-05	0.9824
No. of sheep & goats	0.0011	0.9824		
Farm size			0.2612	0.4780
Constant	-5.9816***	0.0081	2.2809	0.1932
Chi-square	23.420***	0.0014	9.358	0.2279
% correct predictions	71.23		64.38	
Number of observations	73		73	

Note: Model A is the logistic regression for participation in the sale of home-made wool yarn
Model B is for participation in food-for-work.

*** significant at 1% level of significance
** significant at 5% level of significance
* significant at 10% level of significance

VII. Major Constraints to Non-farm Employment

7.1 *Poverty as a Major Bottleneck to Non-farm Employment*

Over the years, the importance of non-farm activities, with the exception of brewing drinks, has declined. This is directly related to the low and declining income of farmers. Agricultural output and productivity is not only very low but also declining. With less than 5 quintals per hectare, yield levels in this area are only half the national levels. Poor soil fertility, high variability, and a delay or absence of rain have reduced productivity. Agricultural production technologies have remained backward as evidenced by the limited use of modern inputs. Only about a third of the sample farmers (37 per cent) use commercial fertilisers. As with the crop sector, livestock productivity is low and declining mainly due to a lack of grazing land and the absence of any modernisation efforts.

That the agricultural sector has failed to support the livelihood of the rural dwellers in North Shoa is evidenced by the community's growing dependence on the market for food. Table 26 shows the level of food self-sufficiency or food balance (defined as the difference between food grain sold and food grain bought) for the study areas. Net buyers (or negative food balance) accounted for 65.3 per cent of the total respondents. The proportion of net buyers or market dependent families was 63.4, 55.4 and 80.0 per cent in Debre Berhan, Ankober and Gera Medir respectively. Households which emerged as net sellers constituted 21.8 per cent in Debre Berhan, 20.6 per cent in Ankober and none in Gera Medir. Among the sample households with net sales, the majority (63.4 per cent) only managed to attain a surplus of less than Birr 200, or less than 2 quintals of grain.

One notable response to the declining level of food self-sufficiency has been increased dependence on livestock. This is also manifested in the high share of revenue from livestock and livestock product sales in total farm cash incomes. Overall, about 75 per cent of total farm cash income was derived from the livestock subsector. The share was 81.7 per cent in Debre Berhan, 65.0 per cent in Ankober and 76.9 per cent in Gera Medir (Annex V).

Table 26: Food Balance (foodgrain sales less foodgrain purchases)

	Debre Berhan	Ankober	Gera Medir	Total
Mean (for all sample HHs)	-199.40	-65.91	-141.21	-137.29
Distribution (%)				
Negative (net buyers)	63.4	55.4	80.0	65.3
Zero balance (self-suffic't)	14.9	23.9	20.0	19.4
Net sellers	21.8	20.6	0.0	15.4
Birr 1-100	7.9	5.4	0.0	4.9
Birr 101-200	8.9	4.3	0.0	4.9
Birr 201 & above	5.0	10.9	0.0	5.6

The increasing dependence on livestock, however, was accompanied by the depletion of animal stocks. As indicated in Section 4.2, the number of oxen, cows and sheep/goats owned has declined for more than 50 per cent of the respondents. In addition to the grazing, disease and other problems which contributed to the depletion, group discussions revealed that farmers have been selling their breeding stock and draft animals to buy food grains.

Faced with falling farm incomes, diversification into non-farm activities can potentially provide a supplementary source of income. Indeed, out of the total annual mean cash income of Birr 1,222.29 (for all respondents), non-farm income accounted for 59 per cent (Birr 721.18) (Table 27). The share was 57.5 per cent (Birr 931.40) in Debre Berhan, 64.8 per cent (Birr 669.52) in Ankober and 54.7 per cent (Birr 501.45) in Gera Medir. However, earnings from non-farm employment have remained inadequate in compensating for the shortfalls in farm income. Income levels have thus remained depressed, leading to a weak demand especially for non-farm goods.

Table 27: Farm and Non-farm Cash Income

	Debre Berhan	Ankober	Gera Medir	Total
Mean income				
farm cash income	687.64	363.62	415.08	501.11
non-farm income	931.40	669.52	501.45	721.18
total cash income	1619.04	1033.14	916.53	1222.29
Share in total income (%)				
farm cash income	42.5	35.2	45.29	41.00
non-farm cash income	57.5	64.8	54.71	59.00

As the possibility of maintaining previous consumption levels through farm and non-farm means became impossible, the sample households seem to have adopted a downward adjustment of consumption patterns as their final coping strategy. According to Cornia (1987), the first items to be dispensed with are usually non-basic requirements such as clothing, consumer durables and leisure-related expenditure. The last to be reduced is expenditure on basic staples and children's education. A comparison between the three sites clearly demonstrates that a lower income is accompanied by a lower demand for most non-basic goods.

Some of the most important items of non-food expenditure (in terms of total amount spent) were clothing, coffee, pepper and spices, *iqub,* ceremonial expenses, investment in livestock, flour mill expenses, onions, salt and cooking oil, in this order (Annex VII). In nearly all cases, the level of mean expenditure as well as the proportion of farmers who reported having incurred costs is lower in Gera Medir and Ankober than in Debre Berhan. For instance, farmers in Ankober and Gera Medir spent, on average, Birr 117.58 and

151.85 on clothing respectively, while those in Debre Berhan spent Birr 195.35. The contrast is more illuminating if one looks at the percentage of households who have not bought clothing; 21.3 per cent in Gera Medir, as opposed to 6.5 per cent in Ankober and 5.9 per cent in Debre Berhan.[22]

The low level of per capita cash income is inadequate to support and sustain the development of a dynamic non-farm sector. The subsistence mode of production also applies to products and services of many non-farm activities. For instance, building thatched roof houses, fences and other construction work, making household furniture, brewing local drinks, making baskets, etc. are all home-based activities which require little or no cash outlay. Even where purchases from a market are necessary to meet demand for non-farm goods and services, the level of cash expenditure is too small to generate a sufficiently viable market. For instance, the average annual household expenditure on clothing is about Birr 157 (Annex VII). Assuming that a third of the textile demand can take the form of locally woven products, the average expenditure on such garments is about Birr 52. This amount is insufficient to buy a single *gabi* even for one member of the family.[23] Traditional weavers in the study area consider weak purchasing power as a major constraint in their operation.[24] Expenditure on household utensils (including earthenware goods) and farm tools is also too small to make pottery and blacksmithing a viable commercial activity. Similarly, the range and number of manufactured goods purchased is too limited to generate adequate demand for small manufacturing works like soap making, leather tanning or the production of farm tools. Hence, rural cottage industries or microenterprises have declined in relative importance as sources of manufactured outputs and employment in the economy.

7.2 *Technological, Institutional, Infrastructural and Cultural Factors*

Non-farm activities are also constrained by several technological and institutional factors. Crafting in Ethiopia is carried out under very primitive conditions, and nothing beyond simple hand tools are used in the production process. Average labour productivity is low, sometimes even lower than that of agriculture. A large proportion of the output of these

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[22] All the respondents have bought coffee, but the mean expenditure varies enormously between the sites. It amounted to Birr 169.72 in Debre Berhan which is 2.3 times higher than Gera Medir or 2.1 than Ankober. A similar difference is observed in the case of sugar, recreation, investment in livestock, ceremonial, education and medical expenses. The mean expenditure on education, for instance, is 57.27 in Debre Berhan, 32.97 in Ankober and 28.05 in Gera Medir. Moreover, only 29.33 per cent of the households in Gera Medir incurred costs associated with education, as compared to 48 per cent in Debre Berhan.The coping strategy has affected food consumption. This is evidenced by the food available per household which is estimated as 12.8 quintals in Debre Berhan, as against 6.8 in Ankober and Gera Medir (Annex VI). The calorie equivalent of the per capita food available is well below the recommended requirement, especially in Ankober and Gera Medir. On the other hand, no significant difference was observed across the sites for some expenditure items. These include taxes and church-related expenses. It is surprising that households in Gera Medir pay the same amount of taxes as their counterparts in Debre Berhan.

[23] *Gabi* is a popular traditional scarf used by both men and women. Because of the high price of factorymade yarn (local weavers use both factory and homemade yarn), a *gabi* is sold for more than Birr 50 nowadays.

[24] Given the per capita clothing expenditure of Birr 27.51 (average family size is 5.7), buying even the poorest quality clothes is impossible, perhaps a reflection of the increasing dependence on second-hand clothes in the area.

household enterprises are inferior goods in the sense that the demand for them is income-inelastic, and they are unable to withstand the stiff competition from urban-based industry. In this regard, one study noted that:

> Blacksmiths, for example, are generally unable to produce sufficient heat in their traditional hearths to work easily with hardened steel, nor are they familiar with annealing techniques. Their principal products include ploughshares, sickles, knives, plough harness connections, simple chisels, and axes and adzes (though with sockets rather than eyes for handle mountings). Similarly, potter families and communities have developed considerable skill in mixing clays and making traditional earthenware vessels. But the manufacturing technique does not include the potter's wheel and methods of firing clay products remain quite simple (PMAC/ILO, 1986).

Access to large urban markets is often thought to spur the development of various kinds of cottage and handicraft activities. This has not been case in the study area mainly because of the backward technology used by craftsmen there. The nature and structure of non-farm activities in Debre Berhan, despite its relatively larger urban market, is no more dynamic or promising than the ones in Gera Medir or Ankober.[25] If anything, it is the sale of animal dung (as firewood) and *araki* which has expanded in Debre Berhan. Traditional pottery products are increasingly substituted by plastic products. To a large extent, small metal workshops using electric power and welding tools have made blacksmiths (using charcoal as a source of energy and simple hand tools) redundant. With few exceptions, traditional handicraft activities have lost their economic importance both in rural and urban areas.[26] The absence of electricity and a water supply system has constrained the development of small industrial enterprises in rural areas.

Among the institutional factors which have constrained the non-farm sector are the 1975 land reform and the lack of a sound development programme. The land reform led to a large-scale absorption of rural artisans into the peasant associations as farmers. The reform, which abolished landlessness, meant an end to full-time crafting. According to the group discussions, many crafting families abandoned their low status trade and took up farming instead following the 1975 land reform proclamation. More importantly, the land reform confined peasants to a single occupation, i.e. farming, thus bringing to an end the practice of supplementing their farm income through part-time non-farm activities. Full-time crafting has largely become an urban-based activity since the 1975 land reform in Ethiopia.

There have been few government policies or programmes directed at the development of rural industries. The Handicraft and Small Industries Development Agency (HASIDA), established in 1977, concentrated its promotional activities on artisanal

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[25] As shown by the regression analysis, farmers in Debre Berhan have not gained more from non-farm activities as a result of their locational advantage.

[26] One craft product that still enjoys a strong demand is the decorated ladies' garment (*hager bahel)* made by special weavers, mainly residing in Addis Ababa.

cooperatives in the major urban areas. The Rural Technology Promotion Division (RTPD) of the Ministry of Agriculture and the Adult Training Centres of the Ministry of Education have failed to bring technological improvement as these institutions were often used as instruments for promoting producers' cooperatives. The distribution of important raw materials like yarn, a major input for traditional weaving, was controlled by the state and was channelled mainly to urban weavers' associations. Hence, individuals engaged in non-farm activities were denied access to technology, a market outlet, raw materials, institutional credit and other support as the regime discouraged individual enterprises.

The marketing of products of non-farm activities can be an important area of concern as evidenced by the carpet makers in Gera Medir. The farmers sell their product directly to consumers in the local market, not to trading enterprises or individuals. This is because the level of production is usually small and/or transport is unavailable or expensive. Commercial activities by farmers were banned under the previous government and trading activities are still constrained by a lack or the high costs of vehicle transport, a shortage of capital to start the business, restrictions due to permit or licence requirements, and check-point *(kella)* charges and local taxes.

Recent reform has liberalised the output market (both of grain and consumer goods), devalued the domestic currency, restructured the parastatals, and partially liberalised the input market. The removal of controls on grain prices and other market liberalisation measures have resulted in increases in grain prices (KUWAB and DSA, 1995). However, it is evident that the vast majority of the households in the study area cannot benefit from the reform as they have no marketable surplus. Indeed, the reform is viewed as undesirable by over 65 per cent of the sample farmers who are net buyers of food grain. In deficit areas like North Shoa, the demand for non-farm goods and services is likely to have fallen after the reform. In addition, with the adoption of the liberal economic policy, some goods like textile products - made by weavers - have faced stiff competition from cheap imports.

Very recently, the government has launched a five-year agricultural development programme based on the SG 2000 extension model.[27] The focus is on high potential areas with reliable rainfall but as yet there is no development programme for non-farm activities or the livestock sector from which marginal areas like North Shoa stand to gain the most.

Lastly, negative attitudes towards crafting communities are believed to have hindered the development of rural cottage and handicraft activities in Ethiopia. Although the public was dependent on a range of artisanal goods, artisans received low social status. Communities specialising in artisanal activities often lived in secluded villages in traditional Ethiopia. According to Pankhurst (1992), blacksmiths, potters and weavers have long been isolated and something of a class apart from the rest of the community. They were deprived

[27] The Sasakawa-Global 2000 (SG 2000 for short) is an international NGO which was launched to popularise the use of modern inputs (e.g. fertiliser, improved seeds, chemicals, etc.) through the establishment of farmer-managed demonstration plots.

of basic rights including access to land. Ethnic groups performing traditional blacksmithing and pottery are still discriminated against in North Shoa.

VIII. Conclusions

Poverty in North Shoa has its roots mainly in the declining productivity of agriculture which in turn is related to a rapid growth in population. As land resources became subdivided and fragmented, marginal or fragile lands have been cultivated, fallow periods reduced and vital forests cut. The result is a continuous decrease in overall agricultural productivity with the average yield of grain currently standing at a dismal 3-5 quintals per hectare.

In an attempt to maintain their subsistence income levels, some farmers have diversified into various types of non-farm activities, including traditional crafting, the sale of food and drinks, trading, engagement in wage employment and various other sources of income. Non-farm incomes accounted for 59 per cent of the total annual cash income of the respondents. Nonetheless, like the agricultural sector, the productivity or the returns from the non-farm sector are very low. Participation in non-farm employment is largely dictated by the need to meet subsistence food requirements. As confirmed by the regression analysis, the tendency to engage in non-farm employment declines if the food balance position of a family is favourable. Because of low returns, non-farm activities are viewed as survival strategies, rather than as a remunerative source of livelihood. Non-farm employment is important mainly for disadvantaged groups like female-headed households whose agricultural output and productivity are lower because of a labour shortage and limited access to modern inputs.

Apart from low returns, some of the non-farm activities such as the sale of animal dung and firewood, common around Debre Berhan, have in fact detrimental effects on agriculture. Despite its importance as an organic fertiliser, animal dung is mainly used as fuel to meet short-term needs. Alcoholism is on the rise throughout urban and rural areas. In areas like Debre Berhan, the distillation of *araki* (the alcoholic content of which is said to be very high) is undertaken as a means of survival by many poor families, especially female-headed households.

Traditional handicraft activities and small enterprises have strong backward and forward linkages with agriculture. North Shoa had a strong tradition of specialised craft-making. Weaving in Ankober and Debre Berhan and carpet making in Gera Medir used to be thriving primary and secondary activities in many rural households. The importance of these activities has declined over time and very few people reported having earned income from such sources at the time this survey was conducted. For the most part, small enterprises like grain mills are absent in rural areas. A variety of problems including poverty or low purchasing power, primitive technology, poor infrastructure, a shortage of

raw materials, restrictive policies, a lack of skills and training and lack of access to credit have reduced the income-generating capacity of crafting industries and microenterprises. The expansion of small enterprises is blocked by low and declining levels of rural income. Farmers use nothing beyond simple tools in their farm operations and the range of consumption items purchased from markets is limited.

A number of measures can be suggested to help overcome the problems constraining non-farm employment. But the primary thrust of any promotional effort should focus on removing demand constraints. Macroeconomic policies favouring the growth of rural income should be given priority. In this regard, the importance of policies which positively influence agriculture cannot be overemphasised. Apparently the areas under consideration appear to have very limited agricultural potential. The intense desire by the farmers in this study area to become food self-sufficient has only resulted in an inefficient use of resources and land degradation. If a hectare of land is yielding only 3 - 5 quintals of grain (sometimes with fertiliser), it makes sense to look for alternative land uses. The SG 2000 approach with its emphasis on fertilisers and improved seeds may not produce the desired outcome. It may have some limited relevance for Ankober but not for Gera Medir where the soil is poorer and the rains more erratic. More importantly, the strategy of increasing crop production in all areas runs against the economic logic of comparative advantage and overlooks the diversity and varying potential of the rural areas in Ethiopia. Only a diversified approach to rural development can bring about the development of a dynamic market and the specialisation necessary for modern economic growth.

A new strategy is required to reverse the economic decline and ecological degradation of the area. It is suggested that a reallocation of land and labour resources in favour of livestock production, in which the area has a comparative advantage, could lead to a more sustainable increase in income. An increased market supply of dairy products (for example in Debre Berhan) and wool (in Gera Medir) could provide a promising opportunity. Studies have shown that the returns from investment in a single crossbred cow can be much higher than the return from a similar investment in crop production.[28] A significant increase in income and employment can be achieved through improvement in the production of small ruminants, pigs and poultry, in these marginal areas. Livestock improvement projects are particularly desirable to enhance the productive employment of women. The agricultural development strategy in the study area should therefore place more emphasis on measures aimed at addressing the fodder, veterinary services, credit, transport and extension bottlenecks. Apart from increasing income, and hence alleviating the demand constraints on non-farm employment, the strategy of intensifying animal husbandry could also have powerful effects on a number of complementary non-farm

[28] For instance, Singh (1989) indicated that income from one crossbred cow can equal that from five acres of irrigated land planted with high-yielding varieties in Asia.

activities such as milk processing and carpet making. Forestry projects should also be initiated as part of the ecological rehabilitation and revenue generation schemes in all areas.

A development programme to promote non-agricultural employment should also give emphasis to the supply-side measures to revive old activities as well as to initiate new ones. A special support scheme can be designed to revive the tradition of weaving (especially in Ankober and Debre Berhan), carpet and mat making (for example in Gera Medir) and blacksmithing. The task of upgrading the skill and production techniques of local artisans should be given special attention to make their products more competitive. The establishment of small processing enterprises (e.g. grain milling, edible oil processing, soap making, etc.) needs to be encouraged.

A package of supply-side measures to stimulate artisanal and small industries should attempt to develop infrastructure (mainly in the form of electricity or power generation, roads, transport facilities, water supply system and telecommunication) and improve marketing arrangements, training programmes and credit facilities. Handicraft activities and small manufacturing and processing firms could greatly benefit from the introduction of solar power generation and windmills in rural areas. Policies for expanding non-farm employment must be directed at improving the supply of raw materials and expanding the number of market outlets for output in order to ensure adequate marketing incentives. Special training programmes are necessary to give rural workers the skills they need for non-agricultural employment. Group lending schemes can be introduced to overcome the limitations of the existing collateral requirements of formal financial institutions. Traditional saving societies *(iqub)* could also serve as a credit delivery mechanism. It is also necessary to underline the importance of financial and technical assistance by donors in easing the national resource and skill constraints which are currently hindering the development of the non-farm sector.

Measures aimed at expanding commercial activities, including the trade of grain and other commodities in remote or inaccessible surrounding areas using pack animals, can have a desirable impact on income as well the food security situation in the region. Improving the incentive to trade would require the removal of existing barriers and restrictions such as licence requirements, check-point charges and taxes on petty trading by the rural poor. Government measures aimed at providing labour market information and ensuring a transparent and unrestricted labour market could create seasonal (migratory) employment opportunities for a large number of people, particularly the youth in the study area. Food-for-work schemes could be directed towards the construction of rural roads, rural water supplies, markets and farm service centres, hence supporting other non-farm activities.

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Annex I: Gross Domestic Product by Economic Activity at Constant Factor Cost (Million Birr)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
A. AGRICULTURE &	5579.2	5386.5	6138.3	5378.9	4241.3	4932.2	5832.0	5695.8	5687.7	5983.9	6151.3	5866.8	6241.2	5907.3
ALLIED ACTIVITIES	4934.5	4717.5	5445.4	4660.4	3559.4	4173.7	5055.7	4904.6	4880.6	5160.5	5313.9	5066.6	5421.1	5101.2
Agriculture	641.1	665.3	689.0	714.5	677.7	754.1	771.7	786.4	801.9	818.0	831.7	795.2	814.8	800.6
Forestry	3.6	3.7	3.9	4.0	4.2	4.4	4.6	4.8	5.1	5.4	5.8	5.0	5.3	5.6
Fishing														
B. INDUSTRY	1224.2	1319.6	1418.4	1473.0	1535.6	1613.1	1727.3	1665.8	1624.8	1559.0	1214.0	1001.8	1272.8	1369.5
Mining & quarrying	12.6	15.0	15.4	19.1	24.9	24.8	25.6	20.0	20.5	19.4	52.9	39.0	57.1	45.0
Large & medium scale mfg	569.3	600.8	638.7	664.4	648.7	687.1	742.6	758.4	759.6	724.3	428.8	315.9	479.8	543.0
Small scale industry &	218.9	232.7	258.3	243.6	225.5	260.3	282.8	261.7	235.6	260.2	224.2	202.3	236.9	241.4
handicrafts	128.0	137.3	142.6	144.8	151.3	162.9	170.1	181.4	199.3	210.3	194.9	186.9	197.8	208.8
Electricity & water	295.3	333.8	363.4	401.1	485.3	478.0	506.2	444.3	409.8	344.8	313.2	257.7	301.2	331.2
Construction														
C. DISTRIBUT'N SERVICES	1523.4	1577.7	1662.5	1692.2	1652.2	1700.3	1975.9	2036.6	1936.5	1969.5	1488.4	1293.2	1601.4	1742.0
Trade, hotels & restaurants	1107.3	1141.5	1195.9	1205.3	1121.4	1105.4	1376.3	1393.4	1277.5	1321.7	910.0	684.3	926.8	1029.5
Transport & communications	416.1	436.2	466.6	486.9	531.5	594.9	599.6	643.2	659.0	647.8	578.4	608.9	674.6	712.5
D. OTHER SERVICES	1765.9	1858.1	1996.1	1986.4	2129.5	2198.1	2347.9	2545.7	2707.3	2848.4	2693.0	2406.4	2719.3	3322.0
Banking & insurance	280.1	269.6	305.7	241.6	286.8	270.4	332.7	394.5	363.8	352.9	324.4	309.6	305.7	722.2
Real estate & ownership of	258.7	267.8	277.1	286.7	296.9	307.3	317.0	327.2	340.8	355.3	368.4	352.9	366.5	381.5
dwellings	661.5	721.0	777.7	793.4	845.4	881.8	914.4	1001.5	1130.8	1231.8	1058.2	842.0	1105.9	1213.7
Public admin. & defence	208.7	222.7	236.8	244.7	255.1	267.8	285.9	299.7	312.3	312.4	316.6	278.5	271.1	278.2
Education	71.5	74.8	79.0	81.8	86.0	89.6	95.2	96.2	100.4	102.9	98.8	100.0	114.7	136.8
Health	285.4	302.3	319.9	338.2	359.3	381.1	402.8	426.7	459.2	493.0	526.7	523.3	555.4	589.6
Domestic & other services														
Total	10092.7	10142.0	11215.3	10530.5	9559.3	10443.7	11883.1	11944.0	11956.3	12360.8	11546.8	10568.1	11834.6	12340.8
Less imputed bank charges	179.5	162.8	198.8	151.7	180.6	174.8	197.3	244.9	236.8	241.2	239.0	242.7	239.6	589.3
Total GDP at constant f.c.	9913.3	9979.2	11016.5	10378.8	9378.8	10268.8	11685.8	11699.1	11719.5	12119.7	11307.8	10325.5	11595.0	11751.5
Mid-year population (millions)	38.7	39.8	41.0	42.2	43.5	45.0	46.5	47.9	49.4	50.9	52.5	50.8	52.4	54.1
Per capita GDP	256.2	250.5	268.7	245.9	215.4	228.2	251.5	244.3	237.3	238.0	215.2	203.4	221.3	217.3

Source: MOPED, National Accounts of Ethiopia, Revised Series Addis Ababa, Sept. 1994, pp. 10-11

Annex II: Area under Cultivation, Production and Yield of Cereals, Pulses & Oilseeds

Year	Cereals			Pulses			Oilseeds			Temporary		Permanent	Total
	Area ('000 ha)	Prod. ('000 tons)	Yield (ton/ha)	Area ('000 ha)	Prod. ('000 tons)	Yield (ton/ha)	Area ('000 ha)	Prod. ('000 tons)	Yield (ton/ha)	Prod.	area	area	area
1980/1	4676.8	5565.5	1.19	698.7	814.8	1.17	214.5	97.6	0.46	6477.9	5590.0	312.9	5902.9
1981/2	4566.7	5316.1	1.16	755.2	800.1	1.06	220.8	78.0	0.35	6194.2	5542.7	310.2	5852.9
1982/3*	4972.4	6648.8	1.34	765.2	931.2	1.22	252.7	115.3	0.46	7695.3	5990.3	335.3	6325.6
1983/4*	4689.7	5504.6	1.17	733.4	687.9	0.94	248.1	94.4	0.38	6286.9	5671.2	317.4	5988.6
1984/5*	4343.1	3836.2	0.88	676.0	454.0	0.67	251.5	89.84	0.36	4380.0	5270.6	295.0	5565.6
1985/6*	4518.2	4412.2	0.98	586.7	406.7	0.69	259.5	92.1	0.36	4911.0	5364.4	300.2	5664.6
1986/7*	4745.3	5600.1	1.18	560.4	509.4	0.91	198.3	76.7	0.39	6186.2	5504.0	308.0	5812.0
1987/8*	5002.6	6087.5	1.22	672.9	507.7	0.75	171.2	66.0	0.39	6661.2	5846.7	327.2	6173.9
1988/9*	4848.5	5685.9	1.17	573.4	520.3	0.91	191.1	63.8	0.33	6270.0	5613.0	314.1	5927.1
1989/90*	4915.1	6088.8	1.24	585.9	590.3	1.01	204.5	76.8	0.38	6755.9	5705.5	319.3	6024.8
1990/91**	4295.2	5577.9	1.30	636.7	896.4	1.41	222.5	287.9	1.3	6762.2	5154.4	288.5	5442.9
1991/2**	4263.3	4929.1	1.16	652.8	583.2	0.89	198.1	78.5	0.40	5590.8	5114.2	286.2	5400.4

Sources: Ethiopia: Statistical Abstract: 1982, p.58; 1984, p.60; 1986, p.61; 1988, p.119; 1990, p. 58; and 1992, p. 63.

* Excluding Eritrea and Tigray

** Excluding Tigray

Annex III: Results of Rural Cottage & Handicraft Industries by Province

Provinces	Number of hh enterprises	Number of persons engaged	Annual Output in Eth.$	Annual Value added Eth.$
Arssi	1,391	1,692	385,632	256,360
Bale	4,556	5,055	1,456,000	710,632
Begemedir (now Gondor)	30,670	32,743	3,020,680	1,224,496
Gamu Gofa	4,683	4,854	504,348	229,840
Hararghe	1,373	1,705	2,230,652	553,176
Gojjam	27,363	39,535	4,895,644	1,365,364
Ellubabor	631	631	87,776	40,300
Keffa	4,490	4,622	878,696	377,000
Shoa	52,848	59,152	7,772,648	5,250,128
Sidama (now Sidamo)	39,779	47,079	10,600,824	3,289,468
Tigre	6,264	6,339	866,892	504,088
Wollega	9,613	9,760	1,120,548	1,038,232
Wollo	26,164	31,912	1,726,608	892,164
Total	209,825	245,077	35,346,948	15,731,148

Source: Provisional Military Government of Ethiopia, CSA, *Advance Report on the 1972-73 Rural Survey of Cottage and Handicraft Industries, Addis Ababa*, April 1975.

Annex IV: Mean Income (for reporting HHs) from Major Components of Other Non-farm Activities (Birr)

	Debre Berhan	Ankober	Gera Medir	Total
Relative support	392.7	255.25	275	327.25
	(6)	(4)	(2)	(12)
Firewood sold (mainly animal dung)	163.57	301.4	214.7	187.3
	(56)	(9)	(11)	(76)
Carpentry	480	100.3	87.5	266.2
	(4)	(3)	(2)	(9)
Masonry	400.0	1	126.7	156.2
	(1)	(1)	(3)	(5)
Hay sold	167.0	1	250	163.93
	(25)	(1)	(1)	(27)
Hops *(gesho)* sold	50.0	195.25	283.3	210.13
	(1)	(4)	(3)	(8)
Vegetables	105.0	457	-	133.4
	(2)	(3)	-	(5)
Credit	700.0	355.29	238.18	359.41
	(4)	(7)	(3)	(22)
Iqub	425.18	756.0	202.5	500.96
	(28)	(13)	(4)	(45)
Others	278.3	355.17	244.0*	266.0
	(3)	(6)	(26)	(35)

Notes: Figures in bracket are the number of households reporting income.

* refers to the sale of home-made wool yarn.

Annex V: Farm Cash Income by Source (percentage)

	Debre Berhan	Ankober	Gera Medir	Total
Revenue from crop sales	18.3	35.0	23.1	25.4
Revenue from sale of livestock	64.9	44.3	56.8	55.6
Revenue from the sale of livestock products	16.7	20.6	20.1	19.0
Total	100.00	100.00	100.00	100.01

Annex VI: Average Food Available and Percentage Contribution of Different Sources

	Debre Berhan	Ankober	Gera Medir	Total
Mean food available (in qts)	12.8	6.8	9.7	9.1
Percentage contribution				
from own cultivation	84.1	86.9	54.7	76.8
from Purchase	15.9	13.1	23.3	17.1
from food-for-work	0.0	0.0	21.9	6.1

Annex VII: Mean Expenditure on Major Non-food Items (Birr)

	Debre Berhan	Ankober	Gera Medir	Total
Clothing	195.35	117.58	151.85	156.79
Coffee	169.72	81.87	73.60	112.45
Pepper and spices	83.32	75.15	61.52	74.40
iqub	358.93	460.13	149.20	368.71
Ceremonial expenses	98.64	72.13	58.67	80.09
Investment in cattle	733.75	486.67	0	694.74
Flour mill expenses	52.82	36.92	48.63	46.23
Onions	46.17	31.87	34.75	38.53
Salt	39.97	31.40	39.88	37.02
Cooking oil	56.33	39.35	41.07	47.32
Education	57.27	32.97	28.05	42.86
Medical expenses	70.46	19.70	20.58	36.03
Kerosine	43.61	30.03	34.04	36.34
Soap	34.13	27.85	29.49	30.74
Taxes	21.80	19.89	19.86	20.61
iddir	21.48	7.60	9.04	12.82
Church-related exp.	12.97	11.18	9.75	11.46
Recreation	43.70	29.65	17.28	13.12

HOUSEHOLD QUESTIONNAIRE

I. General

1. County
2. Peasant Association
3. Name of the farmer
4. Age
5. Sex
6. Education
7. Religion
8. Marital status
9. Family size

II. Family Characteristics

1. Family member
2. Age
3. Sex
4. Education
5. Occupation by rank

III. Agriculture

1. Land use and tenure type 1993/94
   own holding / rented / communal / other type of ownership
   cultivated land
   tree land
   garden
   grazing
   fallow
   other

2. How many plots are cultivated?

3. Fertility of the soil
   i) fertile ii) semi-fertile iii) infertile

4. Were you cultivating more land in the past than you now cultivate? Yes / No

5. If yes, how many years ago?

6. If the size of your holding has decreased, give the reasons.

7. Output by season 1993/94

	Main season		Secondary season	
	Area	Output	Area	Output
barley				
wheat				
teff				
maize				
sorghum				
pulses				
oilseeds				
permanent crops				
vegetables				
others				

8. Do you have labour shortage problems? Yes / No

9. If yes, for which type of activities?
   land preparation
   harvesting
   weeding
   threshing
   guarding from wild animals
   others

10. What means did you use to overcome the shortage?
   hiring labour
   assistance from relatives and friends
   traditional labour exchange arrangements
   did not use any means
   other

11. On which of the following monthly/weekly saint days or holidays do you refrain
from work?
   Saturdays
   Sundays
   1st day of the month (Lideta)
   5th " " (Abbo)
   7th " " (Sellassie)
   12th " " (Michael)
   13th " " (Egizabherab)
   14th " " (G/Kirsotos)
   16th " " (Kidanemehret)
   19th " " (Gabriel)
   21st " " (Mariam)
   23rd " " (Giorghis)
   27th " " (Medhane Alem)
   29th " " (Balewold)
   Others (specify)

12 Use of farm inputs 1993/94
   Did you use commercial fertiliser ? Yes / No
   If yes, give the amount DAP Urea
   Was it bought on credit or on a cash basis
   Did you use any of the following?
      improved seeds Yes / No
      herbicides Yes / No
      insecticides Yes / No
      animal manure Yes / No
      irrigation Yes / No
      other

13. Use of oxen
   How many oxen do you own?
   Do you have a shortage of oxen?
   If yes, how do you overcome the problem?
      by sharing in the form of *Mekenajo*
      assistance from friends and relatives
      exchange of oxen for labour
      by renting oxen
      other

14. Major farming problems
Do you have the following problems?

land shortage	Yes / No
poor soil fertility	Yes / No
lack of rain	Yes / No
too much rain	Yes / No
weed problems	Yes / No
disease and insect plagues	Yes / No
other	

15. Have ever been engaged in a non-farming occupation? Yes / No
If yes, indicate the type of occupation.

IV. Livestock Raising

1. Number owned and cash income obtained:

	No.	Trend	Revenues from sales in 1993/94
oxen			
cows			
young bulls			
heifers			
calves			
sheep			
goats			
horses			
donkeys			
mules			
poultry			
others			

2. Income from livestock products 1993/94
milk
butter
eggs
hides and skins

3. Major problems of animal husbandry
shortage of grazing land
disease
lack of water
predator animals
theft
shortage of breeding animals
others

4. Do you own cross-bred cows? Yes / No

V. Handicraft Activities

1. Is anyone from the family engaged in the following activities? If so, indicate the revenue obtained in 1993/94.
weaving
pottery
blacksmithing
tannery
others

2. Indicate the time/period in which these activities were carried out.

3. Does the activity result in a shortage of farm labour?

4. Indicate the major problems in handicraft activities
   shortage/lack of tools
   shortage/lack of raw materials
   competition from factory-made products
   social stigma
   lack of training
   other

5. What has been the trend over the last 20 years regarding revenue from handicraft
   activities?

6. When were handicraft activities started in the family?

7. Why was the activity started?

VI. Sale of Food and Drinks

1. If anyone from the family is engaged in the activity, indicate the revenue obtained in 1993/94.
   Drinks
   tea
   home-made liquor (*araki*)
   home-made beer (*tella*)
   other
   Food items
   engera
   bread
   kollo
   other

2. Indicate the time/period in which the activity was carried out.

3. Does the activity result in a labour shortage for farming? Yes / No

4. Indicate the major problems in this type of activity.

5. What has been the trend over the last 20 years regarding revenue?

6. When did the family start the activity?

7. Why was it started?

VII. Commercial Activities

1. If anyone from the family was engaged in these activities indicate the revenue obtained
   in 1993/94.
   grain trade
   cattle trade
   sheep/goat trade
   butter trade
   consumer goods
   textile goods
   others

2. Indicate the time/period in which the activity was undertaken.

3. Does the activity result in a labour shortage for farming?