Non- Farm Activities and Production Decision of Farmers:

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1. INTRODUCTION

1.1. Background and Statement of the Problem

Agriculture is the basic economic sector on which the country relies for its social and economic development. Its contribution to the GDP, employment, and foreign exchange earnings, which is in the order of 40 percent, 85 percent and 90 percent, respectively, makes it the uncontestable sector in the country's development prospect. Despite its importance, the sector is traditional and subsistence. At its present level, agriculture can not adequately feed the fast growing population of the country, which is estimated to be about 3.0 percent per annum (CSA 1990). Attempts to increase the productivity of agriculture and bring about rural development have focused on the structural sectoral problems. These problems related to land tenure, lack of inputs, inadequate and fragmented farm size (Arnessen 1989), pricing and marketing (Tesfaye 1989) and overall macro policies of the country (Fassil 1977). The development of agriculture, however, has to be seen not only as a sectoral problem but also as an inter-sectoral problem. The linkage between agricultural and non-agricultural or farm and non-farm[1] activities must be adequately exploited to contribute to agricultural productivity and rural progress. Though the production and consumption linkages of agriculture to other sectors is known in the general literature (Mellor 1976; Hossain 1987), there is little understanding or little research effort on the impact of rural non-agricultural activities on agricultural production (Saith 1992; Evans and Ngau 1991). From this perspective, the role of rural non-farm opportunities for agricultural and rural progress must be adequately understood to foster more functional relationships between agricultural activities and non-agricultural activities.

Recently, the "peasant model", which assumes the livelihood of the rural smallholder in the third world to be conditioned only by access to land, is found to give an adequate picture of the activities of present-day rural smallholder (Smith 1989). Non-agricultural sources of income have to be considered to give adequate picture of the reality. In Western Gautemala, while fewer than 20 percent of smallholders derive their income from agriculture of any sort, most get the greater part of their income and spend most of their time in the production and distribution of non-farm activities. Anderson and Leiserson (1980) indicate that, based on minimal estimates, the percentage of rural labour force engaged in non-farm work in most of the 15 developing countries falls between 20 - 30 percent. In Africa, non-farm activities are primary sources of employment for 10-20 percent of the rural labour force (ILO/JASPA 1991). In Some African countries with a particular problem of population pressure, those engaged in non-farm activities are even higher. A typical example is that of Rwanda, a country experiencing high population pressure, where approximately half (47 percent) of the farm households are engaged in some off-farm activities, and 16.6 percent of all rural households' income comes from off-farm sources (UNSO 1992).

It is now asserted that the non-farm sector contributes to the real income of rural people (Chin 1979), could provide employment in its own right and stimulate agricultural production. However, in which direction, to what extent and through which economic mechanism the rural non-farm sector or changes in its importance affect rural progress in general and agricultural

production in particular needs an investigation and are important issues that are capable of addressing agricultural development problems. Thus efforts to foster agricultural development and rural progress in Ethiopia should exploit the functional relations between the two.

1.2. Research Objective

This research has two objectives: (i) to assess the effects of non-farm activities on the production decision of farmers, particularly with regard to their input usage, cropping mix, cultivated land and extent of commercialisation; (ii) to identify household-level determinants of non-farm activities in the study area.

1.3. Significance of the Study

Rural development, which includes progress both in farm and non-farm activities, seems to be the only hope to bring better days in Ethiopia. Non-farm activities provide not only alternative sources of income and employment for the rural poor but also stimulate agricultural production. Knowledge of the nature, determinants and effects of the non-farm activities provide clues about the character of socio-economic changes which might be induced by the adoption of employment-oriented strategy to promote the rural non-farm economy. Thus this study, by identifying the determinants and impacts of non-farm activities, hopes to provide necessary analytical insights for targeting the rural non-farm sector in Ethiopia.

1.4. Data and Methodology

1.4.1. Data

The basic data in this paper is information collected through surveys in the study areas. The survey was conducted in the month of October 1995. Information is collected through a structured questionnaire.

A three-stage sampling design is used in data collection. In the first stage, one wereda[2] was chosen from each of the two zones in the Southern Ethiopia Peoples and Nationalities Region on the basis of the availability of non-farm activities. In the second stage, two peasant associations (PA's.) were selected from each wereda within a 15-km radius of towns on the basis of high concentration of non-farm activities. In the third stage, households were selected from the four peasant associations chosen. A total of 229 households were selected from the two study weredas. The distribution of the total households and the samples by weredas and peasant associations are given in table 1 and 2.

Random sampling was used to select farmers from roasters of peasant associations. A minimum of 40 households was selected from each of the peasant associations. Those peasant associations with relatively diversified non-farm activities received a higher number of samples. In selecting farmers, it was found out that in each peasant association there are farmers engaged in farm activities alone and farmers engaged in both farm and non-farm activities.

Table 1. Total households and occupational engagements in the study areas

Wereda	Peasant Association	Total number of households	Engaged only in farm work	Engaged in farm and non-farm work	Percentage of total engaged in farm and non-farm work
Kachabira	Gemesha	568	278	290	51.06
	Lesho	487	274	213	43.73
Damotgale	Bibisso	663	422	241	36.34
	Balacosha	480	118	362	75.41
	Total	2198	1092	1106	50.31

SOURCE: Own survey, October 1995.

Table 2. Distribution of samples in the study areas

Wereda	Peasant Association	Total sample	Sample as percentage of total households	Engaged only in farm work	Engaged in farm and non-farm work
Kachabira	Gamesha	79	13.9	24	55
	Lesho	40	8.21	16	24
Damotgale	Bibisso	60	9.84	17	43
	Balachosha	50	10.41	10	40
	Total	229	10.41	67	162

SOURCE: Own survey, October 1995.

Though the main interest of the study is on farmers engaged in farm and non-farm activity, farmers engaged in farm activity alone were also made part of the sample. This will facilitate comparisons between farmers engaged in farming alone and those engaged in farm and non-farm activities.

1.4.2. Methods of Analysis

Different approaches are used to study the influences and effects of non-farm activities. The first approach is comparison of target variables (e.g., input use, household characteristics, etc.) among farmers with various degrees of non-farm income. Such methods will enable us see if there is any difference among different non-farm income groups in their various production, demographic and endowment characteristics. In such a target variable comparison, the pure influences and effects of non-farm activities on target variables may be affected by other variables. Thus, in order to address the functional relationships, econometric models are used. Through these models, an attempt is be made to capture the key relationships under investigation. The econometric models employed in this study are regression models.

1.5. Format

Chapter 2 reviews the findings of research on non-farm activities and provides a conceptual framework for the study. Six testable hypotheses are generated from the conceptual framework to guide the study. Chapter 3 describes the study areas and provides highlights on the demographic characteristics of the sample households. Chapter 4 focuses on the farm economy of the region by examining the size of land, cropping pattern, yield inputs, manpower, draught animal and livestock. Chapter 5 describes the main non-farm activities of the study sites, namely, trade and handicraft activities. Chapter 6 presents the empirical results in the form of target variables comparison and regression models. This section presents the hypotheses of the study and identifies those hypotheses which receive support and those which do not. Chapter 7 summarises the findings of the study and discusses policy implications.

2. REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

2.1. Review of Literature

Attempts to increase the productivity of agriculture and alleviate rural poverty in most developing countries have dealt with the structural sectoral problems. These problems have focused on tenurial, institutional, technical, infrastructural and economic aspects of rural development (Anderson and Leiserson 1980). Rural and agricultural development efforts, however, have to focus not only on sectoral problems but also on inter-sectoral problems. The reason is that raising the productivity of agriculture alone, though necessary, is not a sufficient condition to reduce rural poverty (Chin 1976). The linkage between agriculture and non-agriculture or farm and non-farm activity must be adequately exploited to contribute to agricultural productivity and rural progress.

The peasant model which views peasants' livelihood as being dependent only on access to land is no longer adequate to describe the rural economy (Smith 1989). In fact non-farm activities in agricultural regions have expanded quite rapidly and merit special place in rural and urban development strategies (Anderson and Leiserson 1980). A very systematic study of the rural non-farm sector and its implication, however, is lacking (Saith 1992). Scattered studies do provide marginal treatment of the relation between farm and non-farm sectors as part of rural development issues. The study by Chin (976) considers the role of non-farm sector in rural development by looking at the structure of farm households' income in Taiwan. The Taiwan case is one in which major constraints are removed. Agricultural productivity rose as a result of land reform that abolished tenancy, and an extensive structure of farmers' associations resulted in access to purchased farm inputs. The analysis showed that income from non-farm sources was responsible for rising real income levels and played a role in reducing income inequality within the rural sector (Chin 1976). The income equalising influence of non-farm activities is also noted in rural Japan, where for small farmers about 94.1 percent of total income came from off-farm sources, while for larger farmers the contribution dropped to 29.2 percent of the total income (Saith 1992). The consensus which emerged from various country studies in Asia is that the proportional share of rural non-farm employment and income in the total tends to be much

higher for classes with relatively lower incomes or smaller landholdings (Saith 1992). Such an inverse relationship, however, is not clearly evident in Africa where a different agrarian setting is found.

In a situation where virtually all rural households are engaged in cultivation and where there is little or no surplus to support a specialist, non-land owning, artisan class, the distribution of non-farm activities may show a random pattern with landholding or may be positively correlated with household size. In case of the latter, rural non-farm activity may lead to rural inequality by favouring labour rich households (Saith 1992). Households which made an entry to rural non-farm sector would have surpluses to invest in agriculture[3] or in other activities in urban economy.

The regional patterns of rural non-farm activities or rural diversification are widely different: some arise from local agricultural underdevelopment, while others develop as a result of agricultural growth linkage (Barden 1983). The latter is widely discussed in the rural growth literature whose seminal work is the new economics of growth (Mellor 1976). The rural growth literature makes a case that there is a link between agricultural growth, non-farm activity expansion and reduced rural poverty. The main point of the argument is under certain macro-conditions, a boom in food grain production would not only stimulate growth in agriculture and agro-related sectors (such as trade, transport and services), but also determine the pace and patterns of the industrial expansion (Dunham 1991). Increased prosperity in agriculture and higher levels of rural (consumption) expenditure stimulate rural consumption industries which are likely to be labour-intensive. The implication of this argument is that for successful rural development, it is essential to give priority to agriculture which raises farm income and from which others will follow (Evans and Ngau 1991).

Agriculturally underdeveloped areas could also stimulate non-farm activities. Investigations into household livelihood strategies identify that one of the coping strategies of poor households and households in marginal environments is to engage in non-farm activities (Weismann 1992; UNSO 1992).

Whatever the regional sources of non-farm activities, the extent to which households engage in non-farm activities and the influence of non-farm activities on farm production needs to be fully investigated to understand the dynamics of rural non-farm activities.

Several factors enter to determine the need and access to non-farm activities at household level. Among these are the opportunity cost of time spent on own farm, the off-farm wage rate, human capital characteristics and demographic characteristics of the household (Braun et al. 1991). Access to urban centers or households and location with respect to towns determine the extent to which households engage in non-farm activities.

The literature reports a mixed conclusion on the influence of non-farm activities on agricultural production and rural income. As reported above, while Chin (1976) strongly makes a case that non-farm activity increases rural real income in Taiwan, Low (1981) claims that the effect of increased off-farm earnings opportunities in Taiwan has been different from that experienced by two developing countries in southern Africa. The author mentions that the experience of Taiwan is comparable with those of Swaziland and Lesotho so far as the transfer of labour from farming

to off-farm employment is concerned, while the consequences for farm incomes and production have been different. He presented a model in which a change in employment prospects will lead to increase in total household income in both scenarios of high and low productivity where high productivity represents Taiwan and low productivity represents South Africa. He, however, indicated that there is a decrease in farm income and production in low productivity cases, while there is an increase in farm production and there is no change in farm income in high productivity cases. The main argument of Low (1981) is that the capacity to increase productivity is clearly limited where technological improvements and infrastructural developments are lacking. In areas of low agricultural productivity, increasing off-farm employment results in labour transfer out of farming and leads to reduced farm incomes and production.

Empirical evidences and theoretical arguments, however, support the favourable role of off-farm employment for agricultural production even in traditional agriculture. The favourable role of off-farm employment in agricultural production is evidenced by a case study in Kenya and Nigeria. In Northern Nigeria, farm income is explained by specific off-farm activities and it is found that farm income differentiation is mainly the result of different labour efforts and access to various off-farm earning jobs (ILO/JASPA. 1985). Off-farm employment is also found to have a paramount impact on returns to household labour ascertaining off-farm sector as a factor of differentiation much more so than the use of improved or traditional agricultural technology.

Off-farm employment is believed to increase the risk accepting behaviour of farmers. Risk is one of the key factors that inhibit farmers from adopting improved production methods and innovations. Farmers in general are averse to risk and they prefer using low risk and low cost methods (Roher 1986). All activities in which farmers may engage in order to increase their productivity entail financial risks whether the activity is cultivating more land, purchasing modern inputs or shifting from subsistence to cash crop. The extent to which farmers can easily undertake these activities depends on the strength or capacity to withstand losses as they are all new activities. Households with source of income other than farming are more likely to make new changes and decisions affecting production than other households which derive income only from farming (Evans and Ngau 1991). The case study in Kenya showed that as income from non-farm sources rises in absolute and relative terms, levels of productivity measured in terms of output per unit of land also rises mainly because they are capable of accepting risks related to production decision (Evans and Ngau 1991). Further, it was shown that measures of income diversification are closely related to different production decisions such as area under cultivation, area devoted to coffee, expenditure on production inputs, the proportion of maize sold, cropped land and input usage which are all found to increase farm income in the region. Weismann (1992), after reviewing farmers' livelihood strategies and their land uses, concluded that a household can take the risk of testing new techniques when at least one component of their multiple strategy lies outside the basic subsistence activities.

2.2. Conceptual Framework

The influences and effects of non-farm activities on agricultural production and real income are manifested via complex relationships at household levels. The analysis will be facilitated if the

exogenous factors that influence off-farm employment are separated from endogenous factors that tend to be determined by off-farm employment.

Fig. 1 depicts the basic relationships between both groups of factors. Concerning the exogenous determinants of non-farm employment, we can assume that households produce different levels of farm and non-farm products and engage in trade to satisfy their consumption requirements.

Farmers' production can be grouped into two aggregate products, X and Y. *X* includes all goods and services produced on the farm (home services, cultivating crops and raising animals) and *Y* includes all goods and services produced off the farm (cloth, appliances, etc).

Different farmers will have different production possibilities. Fig. 2 depicts two households with different production possibilities.

Fig. 1. Non-farm employment at household level: Determinants and consequences

SOURCE: Adapted from Evans and Ngau (1991).

Fig. 2. Production possibilities of households

SOURCE: Rief and Cochrane (1990).

Household with production possibility curve $Y_1 X_4$ has less ability to transform farm goods into non-farm goods than the household with $Y_3 X_3$ production possibility curve. The two households become equally well off at a price ratio between farm and non-farm products represented by the line $X_4 Y_5$. Farmers consume at point B and to reach such consumption level, the first household trades $X_1 X_4$ of farm goods for OY_4 of non-farm goods, while the second household trades $X_1 X_2$ of farm goods for $Y_2 Y_4$ of non-farm goods.

Basic to understanding the incidence of non-farm activities is then the nature of production possibilities. Factors, which determine the production possibility of various households, hence, influence a household to concentrate on farm work or to send at least one of its members to non-farm work. These include the farm resource endowment of the households, particularly land (Rief and Cochran 1990), the demographic characteristics of households, the human capital characteristics of households, wage-rate of off-farm employment and location. Farm resource endowment, particularly land, determines the demand for labour. Off-farm employment should thus be inversely related to land availability. Demographic characteristics create the need and condition for non-farm employment. The need arises because an increased man-land ratio leads to an increased demand for off-farm employment in order to generate cash income. The presence of adult persons in the household who are capable of participating in non-farm activities is also an essential component. Non-farm activities, whether crafts or artisanal, require some skill and training; hence, households with some skills and training are expected to be engaged in non-farm

activities than others. Non-farm employment competes with on-farm employment and a relatively higher wage rate in non-farm activities is the attracting force for people to engage in such activities. Households at different locations from market centers have different opportunities in terms of input supply that may be used in non-farm activity and demand for their products. Proximity to urban centers is expected to stimulate non-farm activities.

The endogenous consequences of non-farm activities relate to three production decisions of households. One affects the allocation of income to input expenditures. The second relates to cropping land and the third relates to sales or commercialisation. Generally, households diversify their income sources to avoid risk. Risk is inherent in peasant production and in their production decisions. Off-farm employment is an additional source of income to farmers whose principal work is farm activities. Diversified sources of income by reducing risk lead farmers to invest in farming activities that increase their income. Hence, farmers with more non-farm employment are expected to purchase fertilisers and improved seeds, and engage in cropping activities that are different from others. Concerning the latter, it may be expected that framers with non-farm activities may rent land and expand their cropping land. Commercialisation is believed to be determined by non-farm activities (Braun 1991). Non-farm activities, by generating income, lead not only to more purchases of inputs which are important for cash crops, but also enable farmers to purchase food for subsistence while allowing their land to be devoted to food crops.

A number of hypotheses could be derived from the above basic relationships.

2.3. Hypotheses

The major objective of this paper is to investigate the influence of non-farm activity on the production decision of farmers and the determinants of non-farm activities. One good indicator of the extent of involvement in non-farm activity by households is the level of non-farm income earnings. Thus the hypotheses to be formed pertain to the influence of non-farm earnings on the production decision of farmers and the determinants of non-farm earnings.

Key hypotheses with regard to the influence of non-farm earnings on the production decision and their expected signs are as follows:

> (i) Farmers with higher non-farm earnings are more risk taking as is evident in their higher level of input usage. Non-farm earnings thus have a positive sign for input usage.

> (ii) Farmers with higher non-farm earnings cultivate more land as they involve in share-cropping and land-renting. Non-farm income positively influences amount of cultivated land.

> (iii) Farmers with higher non-farm earnings engage in the production of cash crops. Thus non-farm income has a positive influence on the production of coffee, a cash crop in the region.

(iv) Farmers with higher non-farm income tend to produce more crops for sale. Thus non-farm income has a positive influence on revenue from crop sale.

Key hypotheses on the determinants of non-farm income are:

(i) Skilled and educated people are more prone to engage in non-farm activity. Education thus has a positive impact on non-farm earnings.

(ii) Labour-rich households make a decision of sending more members to non-farm activity. Family size, as indicator of labour availability, has a positive influence on non-farm earnings.

(iii) Urban centers encourage off-farm activity by serving as centers of input and presenting demand or market for outputs. Thus, proximity to urban centers gives rise to diversified rural non-farm activities and higher non-farm earnings.

3. THE STUDY AREAS AND DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

3.1. The Study Areas

The study areas in this paper are Kachabira and Damotgale Weredas. Both are found in Southern Ethiopia Peoples and Nationalities Region (fig. 3). Within the Region, Kachabira Wereda is found in Kembata, Alaba and Timbaro Zone while Damotgale Wereda is found in the North Omo Zone.

3.1.1. Kachabira Wereda

Kachabira Wereda borders Angacha Wereda in the north, Seke and North Omo in the south, Omo Valley and Soro Wereda in the west, and Kedida Gameda Wereda in the east (see fig. 4). The total area size of the Wereda is estimated to be 32,440 hectares or 324.4 square kilometres. The altitude of the Wereda ranges between 1500 meters and 2300 meters above sea level (a.s.l.). The Wereda has about 3 percent of its land in Kolla Zone, 71 percent in the Weina Dega Zone, and 26 percent in the Dega Zone (Wereda Agricultural Office 1995).

There are 23 peasant associations in the rural areas of the Wereda. Shenshicho and Hadaro, the two towns of the Wereda, consist of two urban dwellers' associations. Shenshicho is the capital of the Wereda while Hadaro is a market town. The total population of the Wereda is estimated to be 99,618, with 53,803 males and 45,815 females (Wereda Agricultural Office). In 1995, the population of Shenshicho town was 1,231 while that of Hadaro was 1,461.

Table 3 shows that land use in the Wereda is dominated by cultivated land followed by forest and grazing land. The fact that about 80 percent of the total land is cultivated indicates that almost every cultivable area in the Wereda is cultivated.

Table 3. Land use in Kachabira Wereda, 1995.

Land use	Hectares	Percentage
Cultivated land	25952	80.0
Grazing land	1784	5.49
Forest	2595	7.99
Unutilisable	1298	4.00
Others (construction)	811	2.50
Total	32440	99.98[a]

SOURCE: Wereda Agricultural Office.

[a] Figures do not add up to 100 due to errors in rounding off.

Different types of crops are grown in the Wereda. These include cereals, pulses and oilseeds. The cereals are wheat, barley, teff, maize, sorghum, oats, while the pulses are peas and beans. The main cash crops of the Wereda are coffee, garlic and ginger. Coffee, however, is the most important one as it is grown widely in the Wereda. In fact, the Wereda was formerly under the Ministry of Coffee and Tea, thus indicating its importance in coffee production.

Fig. 3. Relative location of the study weredas

3.1.3 Damotgale Wereda

Damotgale Wereda is found in the North Omo Zone bordering Kambata and Hadiya Zone in the north and east, Damot Weide Wereda in the south, and Sodo Zuria and Boloso Sore Wereda in the west (see fig. 5). The total area size of the Wereda is 40,426.9 hectares or 402.26 sq. km. The Wereda has 5 percent of its land in the Kolla Zone, 86 percent in the Weina Dega Zone and 9 percent in the Dega Zone (Wereda Agricultural Office 1995). The Wereda receives an average rainfall of 1421.6 mms and the average temperature in the Wereda is about 26.2 degree centigrade.

The rural population of the Wereda is estimated at 214,384, of which 98,350 are males and 116,233 are females. The urban population of the Wereda is 7,482 males and 7,974 females, with a total population of 15,486. Boditi is the capital of the Wereda. There are 54 peasant associations in the rural areas of the Wereda and 3 urban dwellers association in Boditi town.

The major land use of the Wereda is cultivated land (see table 4). Unutilisable land is also significant while land under grazing and forest are of similar magnitude.

Typical features of the two `Weredas' are their high population density and scarcity of land. The two `Weredas' are found in one of the densely inhabited parts of the Country. According to the 1984 census, the population densities of the `Weredas' are 318 and 426 per square kilometres for Kachabira and Damotgale, respectively. According to 1993 CSA estimate, Damotgale Wereda has a total population of 234,153 while Kachabira Wereda has a total population of 129,083 (CSA 1992).

This gives a population density of 397.9 and 582.09 per square kilometre for Kachabira and Damotgale Weredas, respectively.

Table 4. Land use in Damotgale Wereda, 1995

Land use	Hectares	Percentage
Cultivated land	29271.9	72.40
Land under annuals	26908	66.55
Land under perennials	2363.9	5.84
Grazing	2756.3	6.82
Forest	3503.1	8.66
Others	800	1.97
Total	40426.9	99.98[a]

SOURCE: Wereda Agricultural Office (1995).

[a]Figures do not add up to 100 due to errors in rounding off.

This situation has made non-farm activity an attractive business in rural areas and farmers in the region are extensively engaged in non-farm activity besides their main farming occupation. Table 2 shows that in all peasant associations surveyed there are significant numbers of farmers engaged in non-farm activity.

3.2. Demographic Characteristics of Sample Population

As indicated above, a total of 229 samples was selected from the two study weredas. Various attribute data of the samples which relate to demography, agricultural production, non-farm activities, expenditure patterns, etc. were collected. A summary of the demographic characteristics will be presented in this section. In order to see variations between samples, the data is summarised by peasant associations. The nature of their agricultural production and non-farm activities will be dealt with in sections 5 and 6.

The sex, age, marital status, religion and ethnicity of the heads of the sample households are presented in table 5.

The table shows that the majority of the household heads are male and belong to the Protestant religion. The majority of those in Kachabira Wereda (Gemesha and Lesho Peasant Associations)

belong to Kembata ethnic group while those in the peasant associations from Damotgale Wereda are Welaita. The mean age ranges from nearly 39 years to nearly 47 years. The sample, therefore, is of older age group, with the oldest being found in Balacosha and Gemesha peasant associations. Farmers in Lesho are of relatively younger age. The marital status of the samples indicates that the overwhelming majority are married with very few single individuals. Most households have members between 4 and 8 (see table 6).

The average household members or family size for the whole sample population is 6.66 with little variation from one peasant association to another. This is higher than the average household size of the country which is reported to be 5.18 in 1988, 1989 (CSA 1993).

Table 5. Percentage of household heads by sex, age, marital status, religion and ethnicity

Characteristics	Gemesha	Lesho	Bibisso	Balacosha	Total
Sex:	100	97.5	98.3	98	98.6
Male	(79)	(39)	(59)	(49)	(226)
	-	2.5	1.6	2.0	1.3
Female		(1)	(1)	(1)	(3)
Ethnicity:	100	85.0	-	-	49.3
Kembata	(79)	(34)			(113)
	-	2.5	100	100	48.5
Welaita		(1)	(60)	(50)	(111)
	-	10	-	-	1.7
Hadiya		(4)			(4)
Religion:	24.1	20	20	60	30.1
Orthodox	(19)	(8)	(12)	(30)	(69)
	5.1	-	10	-	4.4
Catholic	(4)		(6)		(10)
	70.9	77.5	63.3	40	63.4
Protestant	(56)	(31)	(38)	(20)	(145)
Marital status:	91.1	100	98.3	98	95.63
Married	(72)	(40)	(58)	(49)	(219)
	8.8	-	1.6	2.0	3.9
Single	(7)		(1)	(1)	(9)

	Gemesha	Lesho	Bibisso	Balacosha	Total
Widowed	-	-	1.6 (1)	1	0.004 (1)
Age : Mean	43.67	38.88	46.50	45.0	43.86
Minimum	23	20	26	21	20
Maximum	80	68	70	80	80

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

Table 6. Percentage of households by size of household members

Numbers	Gemesha	Lesho	Bibisso	Balacosha	Total
1 - 4	11.4 (9)	17.5 (7)	8.3 (5)	20 (10)	13.5 (30)
4 - 8	88.6 (70)	45 (18)	78.4 (47)	68 (34)	73.8 (169)
> 8	-	37.5 (15)	13.3 (8)	12 (6)	29 (12.7)
Mean	6.54	6.88	6.92	6.38	6.66

SOURCE: Own Survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

The educational status of the sample indicates that the level of literacy is high in Kachabira Wereda while farmers in Damotgale Wereda have a lower literacy rate. As shown in table 7, those able to read and write in Balocosha and Bibisso contrast highly with those in Gemesha. The literacy rates in Balacosha and Bibisso are in the order of 16 and 38 percent, respectively, while those in Gemesha and Lesho are in the order of 64.6 and 77.5 percent, respectively. The mean of the highest grade completed ranges from less than one in Balacosha to 4.25 in Lesho. Formal education is, therefore, higher in Kachabira Wereda as compared to Damotgale Wereda. The mean for the overall sample is 2.78.

Table 7. Percentage of farmers by educational status

Educational status	Gemesha	Lesho	Bibisso	Balacosha	Total

Read	64.6	77.5	38.3	16	49.3
(Yes 0/0)	(51)	(31)	(23)	(8)	(113)
Write	67.1	77.5	36.7	16	49.8
(Yes)	(53)	(31)	(22)	(8)	(114)
Mean highest grade	3.42	4.25	2.55	0.88	2.78

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

4. THE FARM ECONOMY

4.1. Land

The average total land size in the study Weredas is 0.82 hectares with a minimum of 0.52 and a maximum of 2.50 hectares (see table 8). The land size in Damotgale Wereda. The average holding size for the two peasant associations in Damotgale Wereda is 0.54 hectares, while in Kachabira the mean land size is 1.09 for Gemesha and 1.04 for Lesho peasant association. The average land holding for the whole country is reported to be 0.86 hectares (CSA 1995). Hence, while land size in Kachabira is slightly above the national average, farmers in Damotgale Wereda have less than the national average.

Table 8. Mean, minimum and maximum holding size

	Gemesha	Lesho	Bibisso	Balacosha	Total
Mean	1.09	1.04	0.54	0.54	0.82
Minimum	0.50	0.25	0.25	0.12	0.12
Maximum	2.50	2.50	1.00	2.00	2.50

SOURCE: Own survey, October 1995.

Though a significant number of respondents mentioned that land size has not decreased from the recent past (5 and 10 years ago), they believed that present land size has decreased in comparison with what was available 15 or 20 years ago (see table 9). About 42.8 percent and 37.6 percent believed that their land size 15 or 20 years ago was larger than the present size. Fast population growth decreases landholding as land has to be continuously subdivided. The fact that land is not as dynamic as population entails a shortage of land with increased population.

The majority of respondents or about 44.5 percent see redistribution by government to be the major reason for a decrease in land size in their region. Redistribution is actually a function of population growth.

The size distribution of land shows some differences between the two weredas (see table 10). While 70 percent in Balacosha and 68.3 percent in Bibisso cultivate land under 0.5 hectare, the percentage of farmers with land below 0.5 hectares are 11.4 and 12.5 percent for Gemesha and Lesho, respectively. For land size below one hectare, the latter percentages rise to 67.1 and 65 percent, respectively. Thus, the majority of farmers in Kachabira Wereda have land between 0.5 and 1 hectare, while in Damotgale, the majority of farmers have land less than 0.5 hectares. This indicates that the extent of land poverty is higher in Damotgale Wereda than in Kachabira Wereda.

Table 9. Status of land size, percentage of farmers

Status of land	20 years ago	15 years ago	10 years ago	5 years ago
Larger than the present	42.8	37.6	25.8	17.0
	(98)	(86)	(59)	(39)
The same as the present	41.0	48	56.3	64.2
	(94)	(110)	(129)	(147)
Smaller than the present	13.1	11.4	14.8	17.5
	(36)	(26)	(34)	(40)

SOURCE*:* Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

Table 10. Size distribution of land, percentage of farmers

Land size	Bibisso	Balacosha	Gemesha	Lesho	Total
< 0.5	68.3	70.0	11.4	12.5	39.3
0.51 -1.00	31.7	24.0	55.7	52.5	41.9
1.01 - 1.50	0.0	4.0	19.0	22.5	10.9
1.51 - 2.00	0.0	2.0	2.5	10.0	3.5
2.01 - 2.50	0.0	0.0	11.4	2.5	4.4
Total	100.0	100.0	100.0	100.0	100.0

SOURCE: Own survey, October 1995.

The mean number of plots for the study sites is 1.28, indicating that the majority of farmers cultivate one plot. Table 11 shows the number of distributed plots. About 76 percent of the households reported that they have one plot, while only 20.4 percent reported cultivating two plots. The problem of land fragmentation does not seem to be acute in the study sites. This is in

contrast with other studies in which land fragmentation is seen as a major problem of peasants in Ethiopia (see Mesfin 1991).

Land quality is one important attribute of land. Farmers were asked about the fertility and slope (topography) of their land. Most farmers in the study sites believed that their plots are fertile and are also found in plain topography. Table 12 shows the fertility status and topography type of plot one which is owned by all farmers.

Table 11. Distribution of plots

Number of plots	Frequency	Percent
1	172	76.1
2	46	20.4
3	7	3.1
4	1	0.4
Total	226	100

SOURCE*: Own survey, October 1995.*

Table 12. Farmers' description of the fertility and topography of plots

Type	Percentage
Fertility	
Fertile	56.8 (130)
Not fertile	8.7 (20)
Moderate	34.5 (79)
Topography	
Plain	82.1 (188)
Gorge	5.7 (13)
Steep	12.2 (28)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

While land fragmentation and land quality are not major problems of land in the study sites, the size of land is considered to be a serious problem by farmers. About 82.5 percent of the farmers mentioned that their land is too small to support their family (see table 13). As the study sites are overcrowded, there is no land available for expansion. Almost all peasants seem to be aware of the absence of expansion possibility in the region. This suggests that perhaps intensification, both traditional and modern, are the only ways of increasing production in the region.

Table 13. Adequacy of land size and availability of land for redistribution

Response	Frequency	Percentage
Enough land	40	17.5
Land is very small	189	82.5
Land available for redistribution (yes)		2.2
	5	

SOURCE: Own survey, October 1995.

Since the 1975 land reform in Ethiopia, owner cultivator is the predominant type of land tenure in all parts of the country. In the study area, owner cultivators account for 87.3 percent of the households, while private and share cropping is reported by 22 households or 9.6 percent (see table 14).

Table 14. Form and percentage of land ownership

Private	87.3
	(200)
Private/sharecropping	9.6
	(22)
Private/rent	2.2
	(5)
Private/common	0.9
	(2)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

The highest sharecropping is reported in Damotgale Wereda. This may be because the severe shortage of land in the Wereda is forcing them to resort to sharecropping. Sharecropping is practised mainly by older household-heads or female-headed households.

At the household level, by peasant associations, the major land use is cultivation. There is little difference between the total holding size and cultivated land in the study sites. This shows that all the land available is put under cultivation for different crops.

4.2. Cropping Pattern and Crop Production

The predominant types of crops grown by the respondents are teff, maize, enset and coffee. These four crops are reported by the majority of farmers in all the study peasant associations (see table 15). Other cereals such as barely, wheat, beans and peas are limited in their coverage. Crop yields in the region are low. The average yield of cereals in the study sites is 5.52 quintals in the `Meher`[4] and about 6,94 in the `Belg' seasons (see table 16). The yields of cereals by crop types are also low. The average yields of teff, maize, wheat and barley are 4.68, 6.74, 6.58 and 5.23 quintals (one quintal is equivalent to 100 kg) per hectare, respectively, for the `Meher" season.

Production decrease in time is reported by many farmers, particularly in Damotgale Wereda (see table 17). On average, about 51.5 percent of the farmers feel that there is a decrease in production in the study sites. The number of farmers reporting production decrease rises to 85 and 84 percent for Bibisso and Balacosha peasant associations, respectively.

Table 15. Cropping pattern: Percentage of farmers growing crops

Crops	Gemesha	Lesho	Bibisso	Balacosha	Total
Barley:	0.0	0.0	3.33	16	4.3
Meher					
Belg	0.0	0.0	1.6	6.0	1.7
Wheat:	0.0	0.0	0.0	10	2.18
Meher					
Belg	0.0	0.0	0.0	2	0.43
Teff:	96.2	97.5	75	32	76.85
Meher					
Belg	1.2	2.5	10	14	6.5
Maize:	77.2	97.5	30	4	52.4
Meher					
Belg	18.9	2.5	70	86	44.10
Sorghum:	1.2	2.5	5	14	5.2
Meher					
Belg	0.0	0.0	3.3	2.6	6.5
Beans:	0.0	0.0	0.0	8	1.7
Meher					
Belg	0.0	0.0	0.0	4	0.87

Peas:	0.0	0.0	5.0	4.0	2.2
Meher					
Belg	0.0	0.0	0.0	0.0	0.0
Oilsee	0.0	1.09	0.0	0.0	0.43
Meher					
Belg	0.0	0.0	0.0	0.0	0.0
Inset:	62	52.5	65	62	61.13
Meher					
Belg	2.5	0.0	0.0	8	2.6
Vegetable:	5.06	2.5	0.0	16	5.67
Meher					
Belg	1.2	0.0	0.0	0.0	0.43
Coffee:	72.15	80	55	76	69.8
Meher					
Belg	1.2	0.0	1.6	6.0	2.18
Pepper:	0.0	5.0	0.0	2.0	1.3
Meher					
Belg	0.0	0.0	0.0	0.0	0.0
Onion:	0.0	0.0	0.0	2	0.43
Meher					
Belg	0.0	0.0	0.0	0.0	0.0
Ginger:	10.12	30	0.0	0.0	8.7
Meher					
Belg	0.0	0.0	0.0	0.0	0.0

SOURCE: Own survey, October 1995.

Table 16. Mean output, land and yield of major cereal crops and coffee

	Meher					Belg				
Crops	Gem.	Les.	Bib.	Bal.	Total	Gem.	Les.	Bib.	Bal.	Total
Barley	0.0	0.0	0.09	0.19	0.17	0.0	0.0	0.0	0.25	0.25

land										
Output	0.0	0.0	0.50	0.99	0.89	0.0	0.0	0.0	1.58	1.58
Yield	0.0	0.0	5.55	5.21	5.23	0.0	0.0	0.0	6.32	6.32
Wheat land	0.0	0.0	0.0	0.21	0.21	0.0	0.0	0.00	0.25	0.25
Output	0.0	0.0	0.0	1.38	1.38	0.0	0.0	0.00	1.00	1.00
Yield	0.0	0.0	0.0	6.57	6.57	0.0	0.0	0.0	4.00	4.00
Teff land	0.42	0.29	0.26	0.15	0.32	0.25	0.12	0.25	0.16	0.20
Output	1.90	1.66	1.05	0.43	1.50	1.13	0.73	0.72	0.64	0.84
Yield	4.52	5.72	4.03	2.87	4.68	4.52	6.08	2.88	4.00	4.20
Maize land	0.41	0.42	0.26	0.08	0.39	0.63	0.12	0.35	0.21	0.33
Output	2.32	3.54	2.03	0.95	2.63	4.09	0.90	2.89	2.47	2.91
Yield	5.65	8.43	7.80	11.87	6.74	6.49	7.50	8.25	11.7	8.81
Sorg.	0.25	0.06	0.06	0.09	0.09	0.0	0.0	0.03	0.18	0.16
land										
Output	1.00	0.00	0.30	0.38	0.42	0.0	0.0	0.13	0.82	0.73
Yield	4.0	0.0	5.0	4.22	4.66	0.0	0.0	4.33	4.55	4.56
Total cereals land	0.73	0.70	0.30	0.23	0.54	0.65	0.24	0.35	0.29	0.37
Output	3.68	4.84	1.55	0.99	2.98	4.11	1.8	2.79	1.71	2.57
Yield	5.04	6.91	5.16	4.3	5.52	6.32	7.5	7.97	5.89	6.94
Coffee land (trees)	0.16	0.14	13.27*	15.03*		0.37	0.0	20*	17*	__
Output	0.95	1.76	0.26	1.05		3.37	0.0	0.23	0.83	__
Yield	12.18	12.57	0.02**	0.07**		3.37	0.0	0.01**	0.04**	__

Note: Gem. = Gemesha; Les. = Lesho; Bib. = Bibisso; Bal. = Balacosha.

*Represent number of coffee trees.

**Represent output in quintals per coffee tree.

The major reasons attributed for the decreases in production are shortages of land and rainfall. Table 18 shows that farmers who reported both reasons form about 46.7 percent of the total, while farmers who mentioned shortage of land alone accounted for 20.5 percent of the farmers.

Shortage of land is, therefore, the main reason for such a low and declining yield as perceived by farmers.

Table 17. Percentage of farmers reporting status of production

Status	Gemesha	Lesho	Bibisso	Balacosha	Total
Increased	67.1	55.0	8.3	8.0	36.7
	(53)	(22)	(5)	(4)	(84)
Decreased	15.22	32.55	85.0	84.0	51.5
	(12)	(13)	(51)	(42)	(118)
No change	16.5	7.5	5.0	4.0	9.2
	(13)	(3)	(3)	(2)	(21)

Note: Figures in parentheses indicate number of farmers reporting.

Table 18. Major reasons identified by farmers for decrease in production

Reasons	Gemesha	Lesho	Bibibisso	Balacosha	Total
Shortage of rainfall and land	83.5	62.5	16.7	12.0	46.7
	(66)	(25)	(10)	(6)	(107)
Shortage of land	10.1	5.0	25	44	20.5
	(8)	(2)	(15)	(22)	(47)
Shortage of rainfall and inputs	2.5	-	5.0	-	2.2
	(2)		(3)		(5)
Shortage of inputs	2.5	-	5.0	-	2.2
	(2)		(3)		(5)
Shortage of land and input	-	7.5	3.3	-	2.2
		(3)	(2)		(5)
Shortage of rainfall, inputs and oxen	-	-	3.3	6.0	2.2
			(2)	(3)	(5)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses are reporting farmers.

4.3. Crop Sale and Purchase

Table 19 shows that the number of farmers reporting income from crop sale is high in all peasant associations. A total of 194 farmers or 84.7 percent of the total farmers have brought crops to the market. This is quite understandable because farmers have to meet their cash obligations (Mesfin 1991). The cash obligations of farmers are numerous and include land and agricultural taxes, contributions to various organisations, purchase of consumer goods, debt repayments, etc. (Mesfin 1991). Despite the debate, the mean income from crop sale in the study sites is relatively high. Crop income shows variations among the peasant associations. The highest income is reported for the peasant association in Kachabira Wereda while those in Damotgale Wereda have low income from crop sale.

Table 19. Mean income from crop sale and number of households reporting income

	Gemesha	Lesho	Bibisso	Balacosha	Total
Mean income (Eth. Birr)	682.53	801.91	156.17	353.90	509.65
Number of households reporting income	79	32	46	40	194
	(100)	(80.0)	(76.6)	(80.0)	(84.7)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate percentage of farmers.

Farmers do not only sell crops but also buy crops from the market. Table 20 shows the mean crop expenditure and number of farmers reporting crop purchase.

Table 20. Mean crop expenditure and number of farmers reporting crop purchase

Expenditure	Gemesha	Lesho	Bibisso	Balacosha	Total
Mean (Birr)	254.58	300.62	209.79	137.08	215.48
Households reporting crop purchase	30	16	46	29	121
	(39.47)	(40.00)	(76.66)	(58.00)	(52.83)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate percentage of farmers.

About 121 farmers or 52.8 percent of the total purchased crops from the market. The mean expenditure per crop was found out to be 215.48 birr. This amount is almost half that of the mean revenue from crop sale.

The fact that farmers purchase crops has led Mesfin (1991) to conclude that farmers' sales are not surplus. Mesfin believes that selling and purchasing of crops among farmers are not guided by rationality as in the case of selling high value crops and purchasing low value crops or selling at the time of high prices and purchasing at the time of low prices. In fact it is assumed that since farmers sell their crops immediately after harvest, they sell crops at low prices and purchase at high prices. The fact that a high number of farmers purchase crops indicates that farmers in the study areas depend on the market for their subsistence.

4.4. Use of Draught Animals

Draught animals are the main sources of power for plough farming in Ethiopia. Farmers in the study areas use pairs of oxen for farming. A significant number of farmers, however, have one or no ox for the purpose of farming. Table 21 shows that 17 percent of the farmers do not possess any oxen, while those who own only one ox are nearly half or 49.8 percent of the farmers. About 66.8 percent of the farmers have one or no ox. Hence it is a little less than one third of the farmers who have adequate pairs of oxen for farming purposes. The situation is worse in Damotgale Weredas of Bibisso and Balacosha peasant associations. The percentage of farmers with one or no ox in Bibisso is 91.7 percent, while that in Balacosha is 86 percent. The number of farmers who perceived shortage of draught animals as a serious problem is also higher in Bibisso and Balacosha peasant associations. The fact that the majority of farmers do not own a pair of oxen indicates the level of poverty. Similar studies in other parts of the country corroborate the findings. In North Shewa, Mesfin (1991) found that about 44 percent of the farmers own one or no ox while Mulat and Teferi (1995) found that the number of farmers with one or no ox are about 46.27 percent.

The most widely used methods of overcoming shortages of oxen are pairing of oxen with others and using relatives' oxen (see table 22). Such methods will definitely slow the operation of cultivation.

4.5. Use of Inputs

Non-traditional inputs are widely utilised by farmers in the study weredas. In Gemesha and Lesho, 100 percent of the farmers responded yes to the question whether they apply inputs on their land (see table 23). Those who responded yes to the same question are about 95 percent for Bibisso and 76 percent for Balacosha. The most widely used input type is fertiliser. DAP fertiliser has a wider currency than Urea fertiliser in the study `Weredas'. About 73 percent of the farmers indicated that they use DAP fertiliser, while it is only 20 percent who mentioned that they use Urea fertiliser. DAP fertiliser utilisation among farmers range from 96.2 percent in Gemesha to 48.3 percent in Bibisso. The majority of farmers (about 47.2 percent) use credit to get their fertiliser, but about 25 percent indicated that they pay cash for their fertilisers. Such widespread use of fertiliser in the study region is very encouraging compared with other parts of the country where only 20 percent of the farmers are reported to have ever attempted to use fertiliser (Mesfin 1991).

Table 21. Percentage of farmers by oxen ownership and presence of oxen shortage

Number of oxen owned	Gemesha	Lesho	Bibisso	Balacosha	Total
None	10.1	7.5	25.0	26	17
	(8)	(3)	(15)	(13)	(39)
1	46.8	17.5	66.7	60	49.8
	(37)	(7)	(40)	(30)	(114)
2	38	70.0	8.3	14	30.6
	(30)	(28)	(5)	(7)	(70)
3	1.3	2.5	-	-	0.9
	(1)	(1)			(2)
4	2.5	2.5	-	-	1.3
	(2)	(1)			(3)
5	-	-	-	-	-
6	1.3	-	-	-	0.4
	(1)				(1)
Shortage of oxen (Yes)	46.8	40	93.3	80.0	65.1
	(37	(16)	(56)	(40)	(149)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

Table 22. Farmers' response on method of overcoming shortages of oxen

Method	Gemesha	Lesho	Bibisso	Balacoscha	Total
Pair oxen with others	36.7	27.5	73.3	52.0	48.0
	(29)	(11)	(44)	(26)	(110)
Exchange labour for oxen	7.6	37.5	5.0	6.0	5.2
	(6)	(15)	(3)	(3)	(27)
Use relatives oxen	29.1	30.0	80.0	46.0	46.3
	(23)	(12)	(48)	(23)	(106)
Rent oxen	8.9	0.0	8.3	0.0	5.2

<div align="center">(7)　　(0)　　(5)　　(0)　　(12)</div>

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

The fact that land is very scarce must have been the major reason for such widespread use of fertilisers among farmers. Agricultural experts in the region, however, indicated that the amount of fertiliser applied in the two `Weredas' is below the required level. Hence the use of fertilisers to increase yield is limited despite its widespread use. The mean amount of fertiliser usage in the study Weredas is 0.75 quintals. The low application of fertiliser in the region could be due to financial or technical limitations. Farmers may not have enough finance to purchase adequate amount or it could be that peasants do not know the right dosage that has to be applied. Agricultural extension workers can help farmers understand the required amount to be applied. The use of other inputs such as pesticides and improved seeds is very limited in the study sites. In fact it is only 11 percent of the farmers who reported that they use pesticides and 6 percent of the farmers who reported that they use improved seeds.

Table 23. Farmers' utilisation of inputs

Inputs	Gemesha	Lesho	Bibisso	Balacosha	Total
Input usage (yes)	100	100	95	76	93.4
DAP fertiliser users	96.2	90	48.3	52	72.9
Form of obtaining DAP fertiliser:	86.1	47.5	18.3	20	47.2
Credit					
Cash	10.1	42.5	28.5	32	25.3
Urea fertiliser users	6.3	12.5	46.7	14	19.7
Form of obtaining Urea fertiliser:	2.5	10	35	8	13.5
Credit					
Cash	3.8	2.5	1.7	2.0	11.4
Pesticide users	29.1	2.5	1.7	2.0	11.4
Improved seed users	16.5	0.0	1.7	2.0	6.6
Mean fertiliser used in quintals	1.02	0.96	0.39	0.45	0.75
Mean cost of fertiliser	156.24	150.75	69.96	41.84	113.18

SOURCE: Own survey, October 1995.

4.6. Manpower

Manpower is needed to undertake different kinds of activities ranging from cultivation of the land to wedding and harvesting. Transportation is also another activity which requires manpower as most of the goods are transported by human portage. About 23 respondents or 57.5 percent in Lesho, and about 28 respondents or 56 percent in Balacosha believed that they have labour shortages. Those who reported labour shortage in Gemesha are 18 or 23 percent, while those in Bibisso are 23 or 38.3 percent (see table 24). This indicates that the extent of labour shortage varies within Wereda. It is surprising to note such high number of farmers perceiving labour shortage in the region as the study sites are marked by high population density. The fact that there is high involvement of farmers in non-farm activities could be the reason for such labour shortage. Labour shortage is seriously felt in some season and in some agricultural activities. Of the various agricultural activities, harvesting and threshing are the one reported to have the highest manpower shortage. This could be due to the limited period in which both harvesting and threshing have to be finished. The major way of overcoming the man-power shortage is by resorting to friends' and relatives' labour and using traditional social support systems such as `Debbo' and `Wenfel'.

Table 24. Percentage of farmers facing manpower shortage, activities and methods of overcoming shortages

Item	Gemesha	Lesho	Bibisso	Balacosha	Total
Faced labour shortage:	22.8	57.5	38.3	56.0	40.2
Yes (%)	(18)	(23)	(23)	(28)	(92)
Shortage during cultivation: Yes (%)	20.3	52.5	28.3	42.0	32.8
	(16)	(21)	(17)	(21)	(75)
Shortage during weeding:	20.3	42.5	23.3	54	32.3
Yes (%)	(16)	(17)	(14)	(27)	(74)
Shortage during harvest: Yes (%)	21.5	50	36.7	46	35.8
	(17	(20)	(22)	(23)	(82)
Shortage during threshing: Yes (%)	17.7	32.5	33.3	42.0	29.7
	(14)	(13)	(20)	(21)	(68)
Shortage during crop protection:	11.4	20	11.7	28.0	16.6
Yes (%)	(9)	(8)	(7)	(14)	(38)

Measures to overcome shortage: hired labour	2.5	12.5	3.3	4.0	4.8
Yes (%)	(2)	(5)	(2)	(2)	(11)
Use family/friends' labour:	21.5	47.5	26.7	44.0	32.3
Yes (%)	(17)	(19)	(16)	(22)	(74)
Use traditional social support (Debbo, Wenfel)	12.5	17.5	26.7	40	24.0
Yes (%)	(12)	(7)	(16)	(20)	(55)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

4.7. Livestock

Farmers in the study sites own livestock that are used for different purposes. Cattle (oxen, cows, calves), followed by poultry, sheep and goats, are owned by many people (see table 25). The average number of cattle (including oxen, calves) in the overall sample is 4.57. The highest ownership size is reported for Lesho and it is followed by Gemesha. The two peasant associations in the Damotgale Wereda have a relatively smaller number of cattle. Livestock products and livestock, usually smaller animals, are sold to get money. About 108 individuals or 47.16 percent of the farmers reported income from livestock. The average income is about 601.52 birr. The fact that a significant number reported income from livestock and that earnings from livestock are relatively higher in all peasant associations indicate that livestock is an important source of income for the region. About 46 individuals or about 20 percent reported income from livestock products, while only 7 individuals derive income specifically from the sale of hides and skins.

The major livestock problem in the study areas is lack of grazing land (see table 26). About 85 percent of the respondents indicated that lack of grazing place for their livestock is a serious problem. This is related to the scarcity of land in the study sites. Usually, for most farmers, animals graze on some land found in the middle of the village. This land, however, is reported to be increasingly reduced as the land is used for settlement to accommodate new families.

Table 25. Mean values of cattle ownership and earnings from livestock and livestock products

Item	Gemesha	Lesho	Bibisso	Balacosha	Total
Cattle (oxen, cows, calves)	5.24	6.77	3.40	3.06	4.57
	(76)	(39)	(57)	(47)	(219)
Sheep and goats	2.35	2.81	1.72	1.57	2.12
	(37)	(16)	(18)	(23)	(94)
Pack animals	1.08	1.15	1.18	1.00	1.12
	(13)	(13)	(11)	(5)	(42)
Poultry	5.61	7.83	4.47	3.43	5.35
	(61)	(29)	(49)	(23)	(162)
Livestock earnings	681.10	688.63	435.83	613.42	601.52
	(36)	(19)	(29)	(24)	(108)
Earnings from livestock products	65.40	108.00	359.17	194.25	127.98
	(30)	(2)	(6)	(8)	(46)
Earnings from hides & skin	17.50	-	-	150.00	36.43
	(6)			(1)	(7)

SOURCE: Own survey, October 1995.

Note: Figures in parentheses indicate number of reporting farmers.

Table 26. Major problems of raising livestock

Major livestock problem	Percentage of farmers reporting `yes'
Shortage of grazing	84.2
Poor bred quality	36.1
Prevalence of disease	27.2
Shortage of water	18.4

SOURCE: Own survey, October 1995.

The foregoing discussion reveals that the farm economy of the region is characterised by small farms, scarcity of land for expansion, low yield, shortage of draught animals and lack of adequate grazing land.

The farm economy is not then in a position to fully support the dense population of the region. The fact that farmers cannot support their family by farming alone necessitates farmers' engaging in non-farm activities to supplement farm income and support themselves. We now turn to examining the major types of non-farm activities carried out by farmers in the study sites.

5. NON-FARM ACTIVITIES

Different types of non-farm activities can be performed by farmers in rural areas. These activities and their dominance vary from place to place[5]. In the study sites, the predominant non-farm activities are trading and handicraft. Trade is predominant in Kachabira Wereda, while handicraft, mainly weaving, is the predominant activity in Damotgale Wereda. Among the sample population, there are only six households who reported non-farm activity other than trading and handicraft in the study sites. Three households reported sale of `Injera' (traditional staple food) and bread; two farmers are employed as labourers while one farmer earns income from renting cattle. Prior to 1974, population in Kambata and Welaita were known for their seasonal migration to plantation sites and commercial farms. The sample population did not indicate any of this pattern at present. In a similar way, a study by Getachew (1995) also found the insignificance of labour migration at present.

About 162 farmers or 70.1 percent reported that they earn income from non-farm activities. The remaining 67 farmers or 29.2 percent of our sample have no income from non-farm activity (see table 27). The mean income from non-farm activities is 633.95 birr. The highest income is recorded for Lesho and Gemesha in Kachabira Weredas, where 1255.33 and 578.37 birr, respectively, were reported. Distribution of income from non-farm activities shows that about 46.2 percent earn in the range of 1-500 birr. The figure drops to 16.2 percent for income group between 500 - 1000 birr. Those farmers earning above 1500 birr are only 5.7 percent of the total. The distribution of income and the average income vary between the different types of activities carried out in the study sites.

Table 27. Households and distribution of non-farm income

Income type	Gemesha	Lesho	Bibisso	Balacosha	Total
Percentage of households with non-farm income	69.6	60.0	71.6	80	70.7
Number of households with non-farm income	55	24	43	40	162
Percentage of households with no non-farm income	30.3	40	28.3	20	29.2
Number households with no non-farm income	24	16	17	10	67
Mean non-farm income	578.37	1255.33	470.65	513.10	633.95

Distribution of income (%):	43	30	51.7	58	46.2
1 - 500 birr					
501 - 1000 birr	19	15	16.7	14	16.2
10001 - 1500 birr	3.8	5.0	0.0	0.0	2.6
> 1501 birr	3.8	10	3.3	8	5.7

SOURCE: Own survey, October 1995.

5.1. Trade

In the two peasant associations of Kachabira Wereda, about 50 percent of the farmers are engaged in trade (see table 28). The number of farmers engaged in trade in Damotgale Wereda is very small. It is only 8.3 percent and 12 percent in Bibisso and Balacosha, respectively, who reported trading activity. The dominant form of trade is coffee trade, followed by grain trade and cattle trade. Some kind of garment or textile trade is also existent in peasant associations in Damotgale Wereda. Most trade is retail trade with little or no wholesaling activity. As is evident, trade is based mainly on agricultural activity.

Trade in the study sites is a local activity in which buying and selling is made in the local and nearby market towns. Trade items such as coffee are bought on a market day and are sold in the same or another market day at another place. Transportation of trade goods is done using donkeys or self-portage. It is only in Kachabira Wereda that respondents mentioned the use of transport vehicles to shuttle between the towns of Hadaro and Shenshicho (see table 29).

Table 28. Engagement in trade and type of trading

Trade type	Gemesha	Lesho	Bibisso	Balacosha	Total
Households engaged in trade	50.6	50.0	8.3	12.0	31.0
Yes					
No	49.4	50.0	91.7	88.0	69.0
Types of trade:	15	10	0	2.0	7.4
Grain trade					
Coffee trade	32.9	22.5	0	6.0	16.6
Cattle trade	25.3	0	0	0	8.7
Onion trade	3.8	5.0	0	0	2.2
Textile	0	2.5	3.3	2/0	1.7
Retail trade	44.3	40.0	6.7	10	26.2
Wholesale/others	6.3	10.0	0.0	2	4.4

Table 29. Mode of transportation of trade items

Mode of transport	Frequency	Percentage
Donkeys and other pack animals	21	9.2
Self-carried	22	9.6
Hired vehicle	19	8.3
Hired labour	2	0.9

About 25.8 percent of the respondents stated that trade is a supplementary activity, while only 4.4 percent derive their main source of livelihood from trade (see table 30).

Table 30. Reasons for undertaking trade

Reasons for trade	Frequency	Percentage
To supplement farm income	59	25.8
Main source of livelihood	10	4.4

Despite the fact that trade is a supplementary activity, most farmers engaged in trade feel that trade is profitable or somewhat profitable and believed that market conditions in the past five years have improved (see tables 31 and 32). This may be due to the trade liberalisation policy of the country which allowed farmers to participate in trade activity. In the past, farmers were asked to choose a profession and were confined only to one type of activity which in most cases was farming.

Table 31. Conditions of trade

Trade conditions	Frequency	Percent
Satisfactory and profitable	12	5.2
Somewhat profitable	54	23.6
Not profitable	4	1.7

Table 32. Current status of trade in comparison with the last five years

Status of trade in comparison with the last 5 years	Frequency	Percentage
Improved	43	18.8
Not improved	20	8.7
No change	6	2.6

SOURCE: Own survey, October 1995.

In comparing trade with farming activity, farmers feel that farming brings higher income than trade, though trade is preferable to farming in terms of the labour requirements and associated risk elements (see table 33).

Table 33. Comparison of trade and agriculture

Criteria of comparison	Agriculture is better (%)	Trade is better (%)
Income	22.3	7.0
Labour requirement	3.5 (8)	26.2 (60)
Vulnerability to disaster	5.7 (13)	19.7 (45)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

The community in the study areas is favourably disposed towards trade activity and trade is seen as an important activity among farmers. This is evident in the fact that almost all farmers engaged in trade would like to continue with trading activity (see table 34). It will then be quite important to identify the constraints of trade in the study area and work towards alleviating the problems.

Table 34. Future plans of farmers with regard to trade

Future plan regarding trade	Frequency	Percent
Continue with the work	64	27.9
Don't know	5	2.2
No answer	2	0.9

SOURCE: Own survey, October 1995.

According to farmers, the main constraint for trade in the study areas is shortage of capital. About 63 respondents or 27.3 percent singled out shortage of capital as the main bottleneck. This suggests that capital is the key element for trade. Shortage of pack animals is also considered as one of the problems that discourage trade (see table 35).

Table 35. Problems of trade

Problems	Percentage
Lack of capital	27.5 (63)
Lack of pack animals	13.1 (30)
Lack of transport car	7.0 (18)

SOURCE: Own survey, October 1995.

Note: Figures in parentheses indicate reporting farmers.

The highest income from trade is recorded for Kachabira Wereda. The mean income in the Wereda ranges from 1410.42 to 622.94 birr (see table 36). Lower income from trade is recorded for peasant associations in Damotgale Wereda. The income distribution shows that most farmers earn between 1 - 500 birr per year from trade.

5.2. Handicraft

Handicraft is practised in all the peasant associations surveyed. It is, however, predominantly practised in Damotgale Wereda, where 70 percent in Balacosha and 65 percent of farmers in Bibisso reported that they are engaged in handicraft activities (see table 37). The dominant activity in both Balacosha and Bibisso is weaving. About 60 percent of the farmers are engaged in weaving in Balacosha, while those who reported weaving in Bibisso are 55 percent. Weaving is not practised in Kachabira Wereda and the predominant handicraft activity in this Wereda is blacksmithing.

Table 36. Mean and distribution of income from trade

Income	Gemesho	Lesho	Bibisso	Balacosha	Total
Mean income (Birr)	622.94	1410.42	91.67	585.83	834.97
Distribution of income :	57.0	52.5	95	88	72.92
no income	(45)	(21)	(57)	(44)	(167)
1 - 500	25.3	22.5	5	8	15.7
	(20)	(9)	(3)	(4)	(36)
501 - 1000	12.7	12.5	0	2	6.98

	(10)	(5)	(0)	(1)	(16)
1001 - 1500	2.5	2.5	0	0	1.3
	(2)	(1)	(0)	(0)	(3)
>1501	2.5	10	0	2	3.05
	(2)	(4)	(0)	(1)	(7)

SOURCE: Own survey, October 1995.

Note: Numbers in parentheses indicate reporting farmers.

Table 37. Engagement in and types of handicraft activity

Activity	Gemesha	Lesho	Bibisso	Balacosha	Total
Households engaged in handicraft:	25.3	12/5	65	70	43.2
Yes					
No	74.7	87.5	35	30	56.8
Handicraft activity:	0.0	0.0	55	60	27.5
Weaving					
Blacksmithing	25.3	0.0	6.7	4	11.4
Pottery	0.0	5.0	3.3	4	2.6
Tannery	0.0	2.5	0.0	2	0.8
Carpentry	0.0	5	0.0	0.0	0.9

SOURCE: Own survey, October 1995.

Handicraft activities, by and large, are inherited from family and in some cases are learned from friends and neighbours (see table 38). In many cases handicraft activity becomes a family affair in which members of the family participate. In the study area, family members' participation is mainly in the form of providing support services. For example, it was observed that in the case of blacksmithing, while the household head does the main job of smelting and production, children and wife keep the fire going, assist in supplying materials, etc.

Handicraft activity is done mainly during a slack season (see table 39) and hence it does not conflict with farm schedules of the farmers.

Table 38. Source of handicraft knowledge and form of participation by family members

Source and activity	Frequency	Percentage
Source of handicraft knowledge:	67	29.3
Family		
Neighbour or friend	32	14.0
Family members:	85	37.1
Provide support services		
Sell products in market	1	0.4
Do not participate	7	3.1

SOURCE: Own survey, October 1995.

Table 39. Time of engagement in handicraft activities

Time of engagement	Frequency	Percentage
Any time	29	12.7
Slack season	70	30.6

SOURCE: Own survey, October 1995.

About 37.1 percent of the respondents indicated that handicraft is a means of supplementing agricultural income, while only 2.2 percent consider handicraft as a major means of livelihood (see table 40). Most of the handicraft products are sold in local markets which are carried to the market. Raw materials are also secured from these markets.

Table 40. Reasons for undertaking handicraft activities

Reasons	Percentage
To supplement agricultural income	37.1
	(85)
As a major means of livelihood	2.2
	(5)
Inherited from parents	3.9
	(9)

SOURCE: Own survey, October 1995.

In comparing agriculture and trade, respondents believed that agriculture is better than handicraft activity both in terms of income and labour requirement (see table 41). Previously it was stated that trade was better than agriculture in terms of labour requirement. This indicates that handicraft is more laborious than trade activity. The advantage of non-farm activity in terms of lesser risk, however, is revealed in the case of handicraft activity as well.

Table 41. Comparison of handicraft and agricultural activities

Criteria of comparison	Agriculture is better	Handicraft is better
Income	35.8	7.0
	(82)	(16)
Labour requirement	30.1	10.5
	(69)	(24)
Vulnerability to disaster	11.4	18.3
	(26)	(42)

SOURCE*:* Own survey, October 1995.

The majority of farmers believed that the community is not biased against handicraft activities in the study sites though there are some farmers who tend to believe that the community looks down upon and despise handicraft activity (see table 42). The majority of farmers are in favour of continuing with the work side by side with the farming activity (see table 43).

Table 42. Community attitude towards handicraft activity

Community attitude	Frequency	Percent
Lockdown and despise	28	12.2
Favourable and promote	64	27.9
Mixed attitude	1	0.4

SOURCE: Own survey, October 1995.

Table 43. Future plans of farmers with regard to handicraft activity

Future plan regarding	Frequency	Percentage

handicraft activity		
Continue with the work	67	29.3
Abandon the work	26	11.4
Do not know	4	1.7
No answer	1	0.4

SOURCE: Own survey, October 1995.

Farmers see a number of problems associated with the handicraft activity in the study sites (see table 44). These are lack of capital, lack of raw materials and lack of market. It is interesting to see that lack of capital is not mentioned by many farmers as a constraint. This is in contrast with trade activity in which lack of capital was seen as a major constraint. This indicates that handicraft activities do not require high capital. Hence the promotion of handicraft activity in the study sites may need to focus on problems of raw materials and market for the products.

Table 44. Farmers' perception of problems of handicraft activity

Problem	Frequency	Percentage
Lack of capital	4	1.7
Lack of market	14	6.1
Lack of raw materials	35	15.3
Lack of co-operative organisation	1	0.4

SOURCE: Own survey, October 1995.

Farmers indicated that increasing raw material availability, provision of market and government assistance are the major areas of intervention to improve handicraft activity in the study sites (see table 45).

Table 45. Farmers' perception of areas of intervention for handicraft activity

Possible areas of intervention	Frequency	Percentage
Government assistance	31	13.5
Increasing raw material availability	20	8.7
Provision of adequate market	8	3.5
Forming co-operatives	4	1.7

SOURCE: Own survey, October 1995.

The mean income from handicraft activities is reported to be 451.64 birr (see table 46). The highest mean income is recorded for Lesho and Gemesha where income is reported to be 630.0 Birr and 501.4 Birr, respectively. Both peasant associations, however, have relatively small number of people earning income from handicraft. The reason why villages in Damotgale Wereda reported lower income, despite their high involvement in handicraft, could be due to the nature of the handicraft activity. Weaving dominates in the two villages, which must be low paying compared with blacksmithing, and carpentry found in Kachabira Wereda

Table 46. Income from handicraft activity

Income range	Gemesha	Lesho	Bibisso	Balacosha	Total
Households with income from handicraft	21	5	38	35	99
Mean income	501.44	630.00	415.61	435.40	451.64
Distribution of income:	19.0	7.5	46.6	54	31
1 - 500 birr					
501- 1000 birr	5.1	2.5	15	12	9.6
1001 - 1500 birr	1.2	2.5	0.0	2	0.9
>1500 Birr	1.3	0.0	1.7	2	1.7

SOURCE: Own survey, October 1995.

The foregoing discussion revealed that non-farm activity, particularly trade and handicraft production, are widespread in the study sites. Both activities are localised and highly agriculture-based. Farmers engaged in these activities are comfortably placed in the society as the community is favourably disposed towards these activities and farmers wish to continue with these activities. Transportation, capital and raw material problems, as perceived by farmers, remain to be the main constraints that hamper non-farm activities.

Nevertheless, as non-farm activities are good sources of cash income for farmers, it is expected that non-farm earnings will have an impact on farmers' production decisions. It is to the investigation of this phenomenon that we shall now turn to.

6. THE INFLUENCE OF NON-FARM EARNINGS ON PRODUCTION DECISIONS AND DETERMINANTS OF NON-FARM EARNINGS

The main theme of this paper is to investigate whether income from non-farm earnings influence the production decisions of farmers in the study sites. In this section the four hypotheses presented in section two regarding the influence of non-farm activity on production will be investigated. The hypotheses are:

(i) Farmers with higher non-farm earnings are more risk-taking as is evident in their higher level of input usage. Non-farm earnings will thus have a positive sign for input usage.

(ii) Farmers with higher non-farm earnings cultivate more land as they involve share-cropping and land-renting. Non-farm income will positively influence the amount of cultivated land.

(iii) Farmers with higher non-farm earnings engage in the production of cash crops. Thus non-farm income will have a positive influence on the production of coffee, a cash crop in the region.

(iv) Farmers with a higher non-farm income tend to produce more crops for sale. Thus non-farm income has a positive influence on revenue from crop sale.

The respondents were classified into four groups according to their non-farm earnings as shown in table 47. According to this classification all the respondents with no non-farm income are put in one group. The remaining 162 farmers were classified into three equal groups so as to make the number of observations comparable with one another and also with that of the no non-farm income group. The mean non-farm incomes were found out to be birr 154.49; 386.39; 1360.98 for groups 2, 3 and 4, receptively.

The types of production decisions investigated in this paper are cultivated land, fertiliser use, coffee output and income from sale of crops. Table 48 provides the mean values of each of these production decisions for each of the groups classified above.

Table 47. Number of households by non-farm earnings

Group	Non-farm earnings (birr)	Number of households	Mean non-farm income
1	0 birr	67	0
2	1 - 250 birr	54	154.49
3	251 - 580 birr	54	386.39
4	>581 birr	54	1360.98

SOURCE: Own survey, October 1995.

As shown in table 48 those in the high non-farm income group depict higher ownership and cultivation of land, higher usage of fertiliser, higher production of coffee and also higher revenue from sale of crop.

Table 48. Mean values of non-farm income and other production decisions by group

Variables	Group I	Group II	Group III	Group IV	All Groups
Non-farm income (birr)	0	154.49	386.39	1360.98	633.95
Total holding size (ha)	0.96	0.64	0.64	1.01	0.82
Cultivated land (ha)	0.62	0.42	0.44	0.67	0.54
Fertiliser used (kg)	83.4	52.5	50.5	84.7	70.0
Coffee output (qt.)	1.54	1.06	0.88	1.81	1.36
Income from crop sale (birr)	600.36	344.98	378.64	668.28	509.65

SOURCE: Own survey, October 1995.

The next group that comes closest to this group is the group with no non-farm income. As a group, they have above average cultivated land, fertiliser utilisation, coffee output and income from sale of crops. The two groups earning a lower amount of non-farm income (i.e., groups II and III) have fared low in every aspect compared with the high non-farm income and the no non-farm income groups.

The analysis of variance shows that there is a significant difference between the means of each group for each variable (See table 49). Significant group differences were also noted between low non-farm income groups (Groups II and III) and high non-farm income group (Group IV) and between low non-farm income groups and the no non-farm income group. There was no significant difference between the two low non-farm income groups in their different production decisions.

Table 49. Variations between groups for each variable

Variables		Degrees of freedom		
	F- ratio	Between groups	Within group	Total
Non-farm income	59.006	3	225	228
Total holding size	9.4942	3	225	228
Fertiliser use	6.6992	3	225	228
Coffee output	3.8258	3	160	163
Income from crop sale	3.8202	3	225	228

SOURCE: Calculated from own survey, October 1995.

The significant difference between the high non-farm income group and the two low non-farm income groups (groups II and III) may suggest that low non-farm income has little influence on the production decisions of farmers. The reason may be due to the fact that for the low non-farm

income groups, income derived from non-farm activity may be used in basic subsistence and there may not be enough to invest in agriculture. Such observation is in line with the argument that non-farm income could be used as one of the coping strategies for poor households. It seems that at a lower level of income, diversification has little impact on the production decisions of farmers. From this it is possible to suggest that there may be some threshold level beyond which non-farm income can be influencing the production decision of farmers.

The fact that the no non-farm income group of farmers have fared high in their production decision may suggest that these farmers, though they do not have diversified income, may have a stronger farm resources base and other specific characteristics which may prompt them to engage in better production decisions and minimise risk. In fact the mean income from crop sale for this group is higher than the sum of mean non-farm income and crop sale income for group II and comparable to that of group III. Their stronger farm base may be the reason for them not to be attracted to the non-farm activity (see below for discussion on the specific characteristics of this group).

The relationship between non-farm income and production decision was investigated more rigorously by estimating regression models. Separate regressions were conducted for different decision variables. The test for the influence of non-farm income was made mainly for farmers participating in non-farm income (Model I). The result for the total sample, including both those participating and not participating in non-farm activity is given for comparison purposes (Model II).

6.1. Cultivated Land

Non-farm income is assumed to influence cultivated land positively. This is because farmers with diversified income may tend to undertake various production decisions such as share-cropping, land-renting, etc., and as a result cultivate more land.

The regression on cultivated land contains age, number of oxen and family size as control variables. The age of the household is included because older and more established farmers are believed to cultivate more land. The number of oxen is included because farmers with more number of oxen have higher capacities to cultivate more land. Family size is considered important in determining amount of cultivated land for two reasons. First, family size corresponds with higher availability of labour and hence households with more family labour are able to cultivate more land. Second, since the implementation of land reform in the mid-seventies in Ethiopia, land distribution is governed by household size. That is households with more members tend to receive more land which they may be able to cultivate. Thus, the variables of age, number of oxen and family size are expected to have positive signs.

In Model I, non-farm income is positively signed and is significant as expected (see table 50). This means that for farmers participating in non-farm activity, non-farm income increases cultivated land. This could be due to the possible association of non-farm income and cultivated land through share-cropping and land-renting. However, in our study sites, a limited amount of share-cropping and renting is experienced. In table 14, it was shown that about 9.6 percent hold land individually and through sharecropping, and 2.2 percent hold land individually and through

renting. As a result, it is difficult to justify the relation between non-farm income and cultivated land purely on the basis of share-cropping and renting in the study sites.

On the other hand, non-farm activity could encourage the purchase of inputs for land farming such as oxen and hence lead to increases in cultivated land. In fact, in table 51, where expenditure of farmers by non-farm income group is presented, it can be shown that those earning high non-farm income have a higher expenditure on oxen than other groups. Thus the effect of non-farm income on amount of cultivated land could be attributed more through purchase of farming inputs than share-cropping and land-renting in our study sites.

Table 50. Results of regression analysis*

Variables	Model I	Model II
Age	-0.001510	0.001248
	(-0.570)	(0.630)
Oxen	0.138349	0.173126
	(4.359)	(6.264)
Family size	0.013434	0.012475
	(0.838)	(0.937)
Non-farm income	7.050716 (E-05)	4.687430 (E05)
	(2.299)	(1.679)
R square	0.17251	0.19466
Adjusted R	0.15143	0.18028
F-ratio	8.818247	13.53600
N	162	229

SOURCE: Compared from own survey, October 1995.

Note: Numbers in parentheses indicate t- values.

*Dependent variable is total cultivated land

Table 51. Mean expenditure by non-farm income group

	Group I	Group II	Group III	Group IV	Total
Mean farm income	0	154.49	386.39	1360.98	633.95
Expenditure items:	138.92	89.06	70.05	146.01	122.59

Inputs

Oxen	96.27	44.07	28.89	126.07	75.10
Tax	30.40	23.83	22.41	22.57	25.12
Consumption goods	622.99	426.12	416.36	779.37	564.72
Education and health	158.67	76.09	121.26	145.60	127.29
Transport	22,66	18.63	27.00	74.85	35.04

SOURCE: Own survey, October 1995.

The other significant variable is number of oxen. This indicates that those with higher number of oxen cultivate more land than others. In our model, age and family size are not related to the amount of cultivated land. The latter was used to represent family labour and the policy of land redistribution on the basis of family size. The number of adult persons in a family might give a direct measure of family labour than family size as far as labour input is concerned. The effect of family size- based policy is not also borne by the study. In a sample survey of peasants in Meskan and Mareko Wereda, Alemayhu (1996) found that the correlation between family size and farm size is weak. This prompted him to conclude that the policy might have been modified due to unofficial land leasing and selling in the study area. Such conclusions, to some extent, may be true in our study area.

In the second model where the whole sample is used, non-farm income seems to have a weaker relation with cultivated land. This is due to the fact that those not participating in non-farm activity cultivate a larger size of land as depicted in table 48. This will then lessen the significance of non-farm income in the whole sample as opposed to the samples participating in non-farm activity. The result suggests that our hypotheses on cultivated land and non-farm activity gain support for farmers participating in non-farm activities. The mechanisms of having more cultivated land, however, do not seem to be as those specified in the literature.

6.2. Fertiliser Use

Fertiliser use is considered to be positively influenced by non-farm income, and diversifies the income sources of farmers. Farmers with diversified incomes tend to be more risk-taking and as a result venture to use more input. One possible indicator of fertiliser use would be the number of farmers utilising fertilisers on their land. As shown in table 23, there is a wider participation of fertiliser utilisation in the study area. Hence, participation in fertiliser use will not be a good differentiating factor. Instead, level of fertiliser use as manifested in level of expenditure and level of fertiliser applications is chosen as good indicators of fertiliser use. This relationship is investigated both for participating farmers and for the whole sample. Other variables which are thought to influence fertiliser use are controlled in the following regressions. These are age, number of oxen, family size and education. Older people tend to adhere to older practices and disregard the use of fertilisers. Number of oxen and family size, representing animal and labour inputs on the land, enable cultivation of more land which may positively influence fertiliser use. Education changes farmers' attitude and provide information for farmers. It may thus positively influence fertiliser use. Level of fertiliser use will be highly influenced by the amount of cultivated land, among other things. Amount of cultivated land, however, has shown a positive

association with non-farm income (see table 50) and hence a problem of multicollinearity arises. In order to avoid such a problem, cultivated land is dropped from the following regression.[6]

The result (see table 52) indicates that non-farm income has a positive and significant influence on fertiliser expenditure for participating farmers. Increases in non-farm income enhance usage of fertiliser as manifested by higher expenditure for fertiliser. The result is not, however, the same for the whole sample.

Table 52. Results of regression analysis*

Variables	Model I	Model II
Age	0.455979	0.825307
	(0.807)	(1.689)
Oxen	34.991306	36.759821
	(5.474)	(5.697)
Family size	4.172220	5.385346
	(1.355)	(1.824)
Non-farm income	0.010630	0.003995
	(1.800)	(0.647)
Education	9.108369	10.108171
	(4.570)	(5.416)
Constant	-27,787021	-44.5122533
	(-1.022)	(-1.701)
R-square	0.38203	0.32944
Adj.-R	0.36222	0.31440
F-ratio	__	__
N	162	229

SOURCE: Compared from own survey, October 1995.

Note: Numbers in parentheses are t-values.

*Dependent variable is cost of fertiliser.

Non-farm income is found out to be insignificant in the whole sample. This again could be due to that part of the sample population which is not participating in non-farm activity. As this group is a high user of fertiliser (see table 48), the expected positive relationship between non-farm income and fertiliser use tends to be blurred. In both models, education and number of oxen are

positively associated with fertiliser usage. The above result is almost repeated when the dependent variable is the actual use of fertiliser instead of expenditure on fertiliser (see table 53). In both models, the hypothesis on non-farm activity and fertiliser use supports those undertaking non-farm activity.

6.3. Coffee Output

Coffee is one of the cash crops of the region. Farmers in the study sites grow coffee mainly to get cash income. In Chapter 2 it was postulated that non-farm income enables farmers to engage in the growing of cash crops as they will be able to buy food crops.

Table 53. Results of regression analysis*

Variables	Model I	Model II
Age	0.303140	0.499904
	(0.804)	(1.577)
Oxen	20.893534	23.057283
	(4.901)	(5.507)
Family size	3.325178	3.923293
	(1.620)	(2.048)
Non-farm income	0.006754	0.002862
	(1.715)	(0.715)
Education	6.229022	6.580496
	(4.686)	(5.434)
Constant	-23.077153	-31.986792
	(-1.273)	(-1.884)
R-square	0.36360	0.32687
Adj.-R	0.34320	0.31177
F-ratio	17.82541	21.65725
	162	229

SOURCE: Calculated from own survey, October 1995.

Note: Numbers in parentheses are t-values.

*Dependent variable is fertiliser use.

In order to see this relationship, a regression analysis was performed for the two weredas separately (see table 54). The regression for Kachabira Wereda contains coffee land as one of the explanatory variables, while the regression for Damotgale Wereda contains coffee trees as one of the explanatory variables.

In Damotgale Wereda farmers grow coffee as garden crops devoting very small amount of land. Hence, it was not possible for the farmers to give estimates of the amount of land devoted for coffee. Instead they reported the number of coffee trees they own on their land. Other variables which influence coffee production such as total holding size, education number of oxen, family size and age are made part of the regression model. Total holding size enables more land to be cultivated and part of this could be devoted to growing cash crops such as coffee. Number of oxen and family size are inputs that facilitate the production of more coffee. Age and education will have a positive influence on coffee production through their experience and information effects. The model contains the variables non-farm income in linien and squared forms because a curvilinear response function is found to be a better fit.

Table 54. Results of regression analysis*

Variables	MODEL I		MODEL II	
	Kachabira	Damotgale	Kachabira	Damotgale
Total holding size	0.295024	0.827202	0.242691	0.479016
	(1.597)	(3.376)	(1.360)	(1.553)
Education	0.026200	-0.023730	0.0400748	-0.044392
	(1.597)	(-1.073)	(1.255)	(-1.490)
Family size	0.028537	-0.057663	0.044780	-0.086056
	(0.513)	(-1.684)	(0.850)	(-1.888)
Coffee land	7.979002	__	8.509706	__
	(9.545)		(10.455)	
Coffee tree	__	0.022692	__	0.13254
		(4.093)		(1.861)
Age	0.022925	1.643656 (E0r)	0.016853	0.007073
	(2.021)	(0.026)	(1.866)	(0.904)
Non-farm income	6.48757(E04)	4.220024 (E04)	5.218557 (E04)	3.383438 (E04)
	(2.695)	(1.519)	(2.427)	(1.023)

Non-farm income square	-1.01818 (E07)	-1.36860 (E07)	-8.79351 (E08)	-9.05709 (E04)
		(-1.505)	(-2.285)	(-0.756)
	(-2.524)			
Constant	-1.448385	-0.064061	-1.399319	0.069876
	(-2.941)	(-0.208)		(0.167)
R-square	0.76923	0.41716	0.69292	0.16894
Adj.-R	0.74285	0.35415	0.67058	0.10311
F-ratio	29.16626	6.62057	31.02603	2.56645
N	79	83	119	110

SOURCE: Computed from own survey, October 1995.

Note: Numbers in parenthesis are t-values.

*Dependent variable is coffee output.

Table 54 indicates that in Model I, non-farm income is found out to be significantly influencing coffee output in Kachabira Wereda. The positive coefficient indicates that non-farm income increases coffee output. The result for Damotgale Wereda, however, shows that non-farm income has no relation with the coffee output of the farmers. The same pattern is repeated in Model II as well. The fact that we get different responses of coffee output to non-farm income in the two weredas may be related to the amount of non-farm income. Farmers in Kachabira Wereda have a higher non-farm income than those in Damotgale Wereda (see table 27). Thus, coffee output may be responsive to non-farm income but only for the higher non-farm income group.

It is possible to observe that in both regions, coffee output is more related to coffee land and to the number of coffee trees. Other variables such as number of oxen, family size, and education are not related to coffee output for both models in both weredas.

Our hypothesis on the positive relation between coffee production and non-farm income is partially supported. The relation is true in higher non-farm income region than in the lower non-farm income region.

6.4. Revenue from Sale of Crops

In addition to growing cash crops, the magnitude of crop revenue is one indication of the level of commercialisation or farmers' inclination towards the market. Marketed crops can be influenced by non-farm income as those who participate in non-farm activities are expected to have surplus production through their higher usage of inputs, higher cultivated land, etc. Table 48 shows that those earning higher non-farm income also have higher revenue from crop sale. Table 55 gives the results of regression analysis for revenue from crop sale as a dependent variable. The control variables are family size, number of oxen, education and age. Higher availability of inputs such

as labour and oxen are expected to positively relate to surplus production. As in Model I of table 54, age and education are expected to have positive influences on surplus production, through their experience and information effects.[7]

The result indicates that non-farm income is significant in influencing revenue from crop sale. There is a positive influence of non-farm income on revenue from crop sale. Our hypothesis on the relation between non-farm income and inclination towards commercialisation or more revenue from crop sale is supported by our findings.

The foregoing discussion on the influence of non-farm income has revealed that for farmers participating in non-farm activity, non-farm income has a positive relation with production decisions. The relation, however, was blurred for the total sample i.e., when those not participating in non-farm activities were included in the sample. The relation was blurred because the non-participating farmers were found to be stronger farmers with near or equal level of input utilisation, cultivated land, coffee output and income from crop revenue as those in the higher non-farm income group. The fact that the no non-farm income group farmers, despite their limited income diversification, have shown higher amount of cultivated land, input usage, coffee output and crop sales may be related to their personal and endowment characteristics.

Table 55. Results of regression analysis*

Variables	Model I	Model II
Education	11.689277 (0.839)	25.386655 (1.835)
Non-farm income	0.156390 (3.786)	0.138394 (3.025)
Family size	-9.483210 (-0.441)	-9.920693 (-0.453)
Number of oxen	292.644863 (6.545)	306.660240 (6.411)
Age	-0.383208 (-0.097)	8.845412 (2.443)
Constant	16.522260 (-0.087)	-392.764063 (-2.025)
R-square	0.34102	0.25928
Adj.-R	0.31989	0.24268
F-ratio	16.14562	15.61199
N	162	229

SOURCE: Competed from own survey, October 1995

Note: Numbers in parentheses are t-values.

*Dependent variable is revenue from sale of crops.

At this juncture, it is appropriate to ask what characteristic features differentiate those in the no, low and high non-farm income groups from each other to explain their levels of non-farm income and their production decisions. In the following section, we will investigate this by looking at the socio-economic characteristics of each group and the influences of selected

variables on non-farm income. These aspects will be dealt with under the determinants of non-farm income.

6.5. Determinants of Non-farm Income

In second section it was hypothesised that:

(i) Skilled and educated people are more prone to engage in non-farm activity. Education thus has a positive impact on non-farm earnings.

(ii) Labour-rich households make a decision of sending more members to non-farm activity. Family size as an indicator of labour availability will have a positive influence on non-farm earnings.

The previous grouping of households on the basis of non-farm income was applied to see if there are some differences in demographic and endowment characteristics between the groups.

Table 56. Mean non-farm income and other variables by group

Variables	Group I	Group II	Group III	Group IV	Overall
Non-farm income	0	154.49	386.39	1360.98	633.95
Age	43.63	42.78	41.19	41.72	43.86
Mean highest grade	2.45	2.54	2.46	3.37	2.69
Family size	7.01	6.56	6.39	6.61	6.66
Number of adults	4.28	3.46	3.33	3.67	3.72
Dependency ratio	78.10	107.75	106.08	97.88	96.35
Number of oxen	1.40	1.13	0.94	1.33	1.21
Number of sheep and goats	0.75	0.89	0.83	1.04	0.87
Livestock revenue	352.16	194.02	248.19	323.89	283.69
Income from crop sale	600.36	344.98	378.64	668.28	509.65
Total land	0.96	0.64	0.64	1.01	0.82

SOURCE*: Computed from own survey, October 1995.

Table 56 contains various socio-economic characteristics of each group. Age, education, family labour, livestock and livestock revenue are shown in the table. In terms of age, farmers not participating in the non-farm activity are older than those participating. These farmers must have been well-established and experienced farmers. The fact that they are experienced implies that they might be better off in their farming activity. This may be one of the reasons for not being attracted to non-farm activity. The old age of these farmers may also imply that these farmers are traditional and hence do not venture into activities that are different from the old established farming activity.

With regard to education, non-participating farmers are comparable with those in the low non-farm income group. The highest educational level is recorded for those in the highest non-farm income group. Education then seems to positively influence non-farm income. Those educated are more risk-taking, possess information and venture into non-farm activity at a higher level. In terms of family labour, those not participating in non-farm activity are well endowed. Not only do they have a larger family size, but also a higher number of adults who can participate in farming. Their dependency ratio is the lowest of all groups. This implies that there is a high participation rate of family labour in production. The dependency ratios for the low non-farm income groups (Groups II and III) are the highest recorded. These groups are characterised by low family labour and low participation of family members in production. The implication is that there is a high chance of income being used for subsistence in these groups. Conversely, the chance for investing in the improvement of agricultural production will be low. Those in the high non-farm income group are better-off in their family labour and dependency ratio than the low non-farm income group.

The livestock endowment of the groups shows that those not participating in non-farm activities have a higher number of oxen and derive higher revenues from livestock resources. It is known that livestock resources are important means of averting risk. Livestock resources can be used or sold, or can easily be liquidated in time of need and also be used as a source of supplementary income. The fact that farmers in the no non-farm income group are endowed with higher amount of livestock resources makes them relatively better off. This may be a partial explanation for their high usage of fertilisers, higher coffee output and larger cultivated land.

With regard to those engaged in non-farm activities, farmers in the high income group are younger, better educated and have more resources in terms of oxen, sheep and goats, and derive a higher revenue from livestock than others who earn a lesser non-farm income.

A regression analysis was undertaken to estimate the influence of these factors on non-farm earnings (see table 57). The dependent variable is non-farm income. The explanatory variables are demographic and resource endowment characteristics of individuals. Age, education and family size represent the demographic characteristics. The variable `farm' is used to denote the farm resources of individuals. It is defined as the proportion of farm income (crop sale plus livestock revenue) in total income. The variable will indicate the strength of the farm sector for each of the sampled households. Farmers with a larger amount of land, higher number of oxen, etc. will have a higher proportion of their income derived from the farm sector. This variable is expected to have a negative influence on non-farm earnings. Another variable that is used in this study is the variable *Enset*. Enset is a dummy variable which stands for `enset' growers. Enset is a regional crop which has high yield and hence serves as a measure of household food security in the study sites. The variable is expected to have a negative sign in influencing non-farm income, because those who grow enset may be less attracted to non-farm activity.

The result (table 57) shows that among the demographic characteristics, education stands out significantly and influences the non-farm income in a positive manner. Family size and age are not related to non-farm income in our model. The reason why family size is not significant may be due to the small variation witnessed in family size in the region (see table 6). The variables

`farm' and `enset' have shown negative influences and have turned out to be significant in the study.

In line with the expectations then, farmers with more farm resources are less attracted to non-farm activities. In the study region farmers who are enset growers are less attracted to non-farm activity than the non-growers of enset. This is because of the fact that enset, as a security crop, reduces the need for more non-farm activity among farmers. Therefore, the hypothesis on the influence of education on non-farm income receives support while the hypothesised relationship between family size and non-farm income does not get support.

Table 57. Results of regression analysis*

Variables	Model I	Model II
Age	5.158113	3.030121
	(0.688)	(0.583)
Education	71.153738	52.271774
	(2.860)	(2.880)
Family size	38.089527	31.613438
	(0.984)	(1.088)
Farm	-879.528033	-1018.714387
	(-3.559)	(-6.749)
Enset	-238.075000	-195.972883
	(-1.707)	(-1.917)
Constant	510.790375	704.997070
	(1.428)	(2.679)
R-square	0.11031	0.20080
Adj.-R	0.08179	0.18222
F-ratio	3.86823	10.80411
N	162	229

SOURCE: computed from own survey, October 1995.

Note: Numbers in parentheses are t- values.

*Dependent variable is non-farm income.

6.6. Urban Centres and Rural Non-farm Activity

Urban centres create demand and provide inputs for various rural non-farm activities. Villages near urban centres are expected to have a greater number of households engaged in non-farm activities and show a more diversified pattern of non-farm activities. In our study sites important the urban centres are Shinshicho and Boditi (see figures 4 and 5). Shenshico is the capital of Kachabira Wereda and Boditi is the capital of Damotgale Wereda. The study villages in Kachabira are found in close proximity to Shenshicho, though Gemesha is closer to Shenshicho than Lesho. In Damotgale Wereda, Boditi is closer to Balacosha than to Bibisso. Earlier, table 27 presented the households engaged in non-farm activities and the distribution of income by peasant associations.

According to that table, Gemesha which is nearer to Shenshicho than Lesho and has a higher number of people earning income from non-farm activity. Similarly, Balacosha, which is nearer to Boditi than Bibisso, has a higher number of people engaged in non-farm activity. This indicates that villages near urban centers have more involvement in non-farm activities.

The mean non-farm income in different villages indicates that Balacosha, which is nearer to Boditi than Bibisso, has a higher income, indicating that those in close proximity to urban centers earn a higher income. Such a relationship, however, is not evident in the cases of Gemesha and Lesho. Lesho has the highest mean income than Gemesha. This could be due to the presence of Hadaro, an important market town in the wereda in the vicinity of Lesho (see figure 4). Table 58 provides the types of non-farm activities in the different peasant associations.

In the handicraft sector, Gemesha has a higher percentage of people involved in trade than Lesho. The type of handicraft activity in Gemesha is blacksmithing, which also caters to the demand for urban dwellers. Handicraft activity in Lesho is more in pottery and tannery, which may be mostly to satisfy local demand. In Damotgale Wereda, Balacosha has a higher trading activity than Bibisso, which could be associated to its proximity to Boditi. In terms of handicraft activities, the two peasant associations seem to be equally diversified.

Owing to the nature of the study areas, it is not possible to clearly measure the impact of urban centers on non-farm activity as hypothesised in Chapter II. There is, however, some indication that villages nearer to urban centres have a higher number of households earning non-farm income and a greater involvement in trade activity, which are indications of the positive impacts of urban centres on non-farm activity.

Table 58. Types of non-farm activities in the study areas

Types of activity	Gemesha	Lesho	Bibisso	Blacosha
Grain trees	15	10	0	2
Coffee trade	32.9	22.5	0	6.00
Cattle trade	25.3	0	0	0
Onion trade	3.8	5.0	0	0
Textiles	0	2.5	3.3	2.0

Weaving	0	0	55	60
Blacksmithing	25.3	0.0	6.7	4
Pottery	0.0	5.0	3.3	4
Leather work	0.0	2.5	0.0	2.0
Carpentry	0.0	5.0	0.0	0.0
Households with non-farm income	69.6	60	71.6	80

SOURCE: Own survey, October 1995.

7. CONCLUSIONS

7.1. Summary

This study attempts to investigate the influence of non-farm activity on the production decision of farmers and to identify the factors influencing non-farm activity. The basis for the study is the belief that the constraints of the farm sector cannot be overcome by concentrating only on intra-sectoral structural problems, but that inter-sectoral issues need also to be addressed. Non-farm activities are found to be the major employers in rural Africa and nowadays the literature recognises that the peasant model which views peasant livelihood to be exclusively dependent on land is not adequate to describe the rural economy.

The study is done in a desegregated household context. This allows for the use of individual data to test hypotheses put forward. Seven hypotheses were put forward to study the impact of non-farm activities on production decisions and identify the determinants of non-farm activity. Non-farm income was used as a measure of the importance of non-farm activity in the households' economy. After briefly looking at the characteristic features of the farm and non-farm activities, the hypotheses were tested by estimating separate regression models for the different production decisions and determinants of non-farm income.

The features of the farm sector revealed that in the study sites the farm sector is characterised by shortage of land, low yield of crops, shortage of draught animals and lack of grazing land. This led to the conclusion that the farm sector is not adequate to support the high density of population in the study sites. Farmers in the study sites have shown that higher involvement in non-farm activities and income from non-farm sources play a major role. The main non-farm activities of the study sites are trade and handicraft activities. Trade is dominant in Kachabira Wereda while handicraft activities, particularly weaving, are dominant in Damotgale Wereda.

The sample households were classified into four groups on the basis of their non-farm income. There were 67 individuals with no non-farm income. The remaining 162 individuals were classified into three groups with the mean income of 154.49; 386.39; and 1360.98 birr. The group comparison revealed that there are significant differences between the groups in their various production decisions. It was found out that as non-farm income increases the amount of cultivated land, fertiliser usage, cash crop production and revenue from crop sale increase. The study revealed that the group of farmers with zero non-farm income were also found to have a higher status in these phenomena. The two groups with low non-farm income are found to have lower input utilisation, lower cultivated land, lower coffee production and lower revenue from crop sales. For these groups, the non-farm income may be used in subsistence, hence leaving nothing or limited earnings to be invested in agriculture.

The regression results revealed that for farmers participating in non-farm activity, non-farm income increases the use of fertilisers, cultivated land, coffee production and revenue from crop sale. The result indicated that the hypotheses on the influence of non-farm activities have some

support. The inclusion of those non-participating farmers with those participating in non-farm activity revealed that the relationships are not evident.

Concerning the determinants of non-farm income, it was found out that those not participating are older, have more family labour and own more livestock resources. These characteristics are thought to give these farmers better farm resources and make them less attracted to non-farm activities. Those participating in non-farm activities are found to be relatively younger and more educated. The livestock resource of those in the high non-farm group is high and this group has also a high family labour compared with the two low non-farm income groups. The regression results on the influences of non-farm income showed that education is a significant variable as hypothesised, while family size has no relationship.

Though the nature of the study sites did not enable the actual measurement of the impact of urban centres on non-farm activity, it was found out that villages near urban centres have more number of households earning non-farm income and engaging in a trade activity which requires the existence of an urban centre in close proximity.

7.2. Implication for Policy

The fact that agriculture is the backbone of the Ethiopian economy necessitates overcoming all problems associated with it so that it is possible to move it forward. Farmers make production decisions by safeguarding themselves from associated risks. The fact that farmers make use of less inputs and concentrate on traditional crops is due to the fact that there is little risk in continuing with traditional methods. In the absence of organised risk-averting methods for farmers such as insurance policies, government programmes, etc., farmers minimise risk in their own way by sticking to the traditional methods.

One possible way of minimising risk is by diversifying activities and sources of income. As farmers' engage in non-farm activities, they earn diversified income and this prompts them to be more risk-taking. The fact that non-farm income is positively related with various production decisions of farmers, and those farmers with higher non-farm income are better off than those with low non-farm income shows the intricate relationship between farm and non-farm income in the study region.

Rural policies should aim at integrating farm and non-farm activities at the household level and should not be confined to agricultural polices or sectoral problems and issues alone. A lasting solution to agricultural problems of the country comes through adopting a broader local development strategy that includes both farm and non-farm activities. In this regard, the findings of the study which revealed that more educated farmers are more likely to involve in non-farm activities suggests that education could be an effective instrument in achieving the aim of integrating farm and non-farm activities in a regional and local economy.

An alternative way of minimising risk and that may lead farmers to engage in better farm production decisions is a stronger farm resource-base, particularly pertaining to easily liquidable livestock resources. In the study sites, farmers not engaged in non-farm income generating activities, but with a higher endowment of livestock resources, are found to make better

production decisions. One of the components of integrating farm and non-farm activities should then emphasise the development of easily liquidable resources such as livestock.

Notes

[1] Non-farm activities are taken here as being synonymous with off-farm activities and they include all kinds of crafts and artisanal works such as pottery, weaving, iron work, wood-work, tanning, etc. They also include local activities such as liquor selling, wood selling, tailoring, commerce, trade, etc.

[2] A `wereda' is an administrative unit in Ethiopia. The hierarchy of administrative units in Ethiopia is such that the country is divided into regions which in turn are divided into zones. Each zone comprises weredas and the weredas are divided into peasant associations and urban dwellers' associations.

[3] In fact the main argument for households engaged in non-farm activities to invest in agriculture is their inclination to make new decisions as a result of their diversified source of income, which reduces risk of investment (see below).

[4] `Meher' is the main growing season in Ethiopia while `Belg' is the secondary growing season. It is only places which receive `Belg' rain during February, March, and April that can experience `Belg' growing season.

[5] For example in Ethiopia, Mulat (1995) has documented the presence of wage employment, sales of food and drinks, sales of animal dung, handicraft, and trading as being practised in the North Shewa Zone.

[6] In a model where cultivated land is included, but not non-farm income, cultivated land has shown a positive and significant effect.

[7] Other variables such as fertiliser use and cultivated land are not included in the regression to avoid multicollinearity with non-farm income

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