CHAPTER 1
INTRODUCTION

1.1 THE PROBLEM IN ITS CONTEXT: AN OVERVIEW OF THE NATIONAL AND REGIONAL SCENARIOS OF POPULATION, RESOURCE AND WELFARE

Ethiopia is one of the Sub-Saharan African (SSA) countries known for their fast population growth, accelerated environmental degradation and structural food insecurity. Singh (1998:295) succinctly describes the challenge that has faced the country in the new millennium as follows:

> *"Ethiopia today, as it enters into the twenty-first century, is in a real crises; her development fulcrum within the problematique very much hinges between two axial poles- one of fast population growth rate and the other of accelerating environmental resource degradation. Both of these problems together are accelerating mass poverty and destitution as causative factors but they themselves seem to be the twin products of poverty."*

Ethiopia's population grew from 23 million in 1960 to 37 million in 1980 and it had reached 49 million in 1990 (Ezra, 1997, cited in Degefa and Nega, 2000). Ethiopia's Central Statistical Authority (CSA) estimate shows that population of the country had reached 65.5 million by October 2001 and that it would double in 30 years with the annual growth rate of nearly 3% (CSA, 2001). The population density (persons1 per square mile) of the country grew from 50 in 1960 to 100 in 1991 and is expected to reach about 300 by the year 2020 (U.S. Bureau of the Census international database, cited in Jolly and Torrey, 1993).

The population growth is more pronounced in rural areas. The share of rural population in the total population of the country (85%), higher total fertility rates in rural areas and the past government agricultural policies are commonly held responsible for the relatively accelerated growth rate of rural population. The population pressure hits the Highlands (1500 meters above sea level) hard due to unbalanced distribution of rural settlements. Highlands are generally preferred for their relatively favourable climate and long growing period that exceeds 180 days. The Ethiopian Highlands which cover only about 50% of the total land area

accommodate 85-90% of Ethiopia's farmers and account for over 95% of cropped area, around 66% of livestock and 90% of the national economic activities (Ejigu, 2000). Human and animal diseases, mainly malaria and tsetse fly, harsh weather, lack of irrigation, market and basic social infrastructures have discouraged settlement in most part of the sparsely populated lowlands (Degefa and Nega, 2000).

Ethiopia is a large country with the estimated total land area of 111,811,000 hectares. However, only 30% of the total land area can be used for rain-fed cultivation. The figure rises to merely 38% even when vertisols, that requires special management to deal with drainage problem, and steeper slopes (over 30% slope), the sustainable use of which requires growing more perennials commensurate with investment in improved soil and water conservation technology, included (FAO, 1988, cited in Gebre Egziahber, 1995a).

The rapidly declining farm size is, therefore, logically the direct consequence of such population pressure. The limited natural resource base has to be distributed among more and more rural people in the absence of employment opportunities in the primary industries such as mining and the other secondary and tertiary industries in the country. As a consequence, the national per capita landholding had declined dramatically from 0.28 hectares (ha) in 1960 to 0.13 ha in 1980, and it had diminished further to 0.10 ha in 1990 (Degefa and Nega, 2000). Table 1.1 displays the most recent statistics regarding size distribution of cropland and average households' cropland holding at national level. According to the table, 36% of the farm households cultivate cropland that is less than half a hectare in size and 63% of them cultivate less than a hectare, the average being 1.02 ha (CSA, 1998).

The 1975 land reform and subsequent periodic land redistribution in the country were supposed to address the problem of landlessness and underemployment of labour in the country. Nevertheless, rural landlessness, estimated to 15% to 20% (Rahmato, 1996), and rural unemployment and underemployment, estimated to 25% to 45% (Demeke, 1996), are the growing problems. Land related intergenerational conflicts (Abate, 1995), sometimes resulting in violent clashes, are on increase. In the mid 1980s, it was predicted that the country would face grazing land 'crisis' by the year

2000 and cropland 'crisis' by the year 2010 unless the level of population growth and the land use systems were changed (Hurni, 1988, cited in Gebre Egziahber, 1995a).

Table 1.1: Distribution of total number of households and cropped area (ha) in 1996/97

Size of crop area (ha)	Cumulative % of households	Cumulative % of area cropped	Average cropping area per household
< 0.1	5.9	0.3	0.1
0.1 – 0.5	36.3	9.3	0.3
0.51 – 1.00	62.3	28.1	0.7
1.01 – 2.00	87.2	63.	1.4
2.01 – 5.00	99.4	96.	2.8
5.01 – 10.00	100	100	6.0
Average			1.0

Source: Computed from CSA, 1998 by Adal, 1998

The situation in the study area, the Hararghe Highlands (HHs), is worse. Hararghe is considered as one of the three zones, together with Wollo and Tigray, in the country where cropland is the most limiting factor. Population density of the HHs ranges between 230 and 410 persons per square kilometre (Scoones, 1996, cited in Adnew, 2000) and 67% of the holdings are below a hectare, the average being 0.875 ha (Tadesse, 1998). According to Diriba (1995), the landless already accounted for 15% to 20% of the rural households in the HHs in the mid 1990s.

The degradation of the renewable natural resource in Ethiopia in terms of soil fertility depletion, deforestation and dwindling communal grazing land is well documented (e.g. Gebire Egziahber, 1995a; Gebre Silassie, 1995; Tegegne, 1995). The natural forest is disappearing and soil depletion has reached an alarming rate, and shortage of grazing land is increasingly becoming a serious problem. This threatens the long-term sustainability of rural livelihoods and the natural resource use as well. According to FAO, 50% of the highlands are eroded, of which 25% are seriously eroded, and 4% have reached a point of no return (FAO, 1986, cited in Shiferaw and Holden, 2000). In economic terms, soil erosion causes an estimated average annual productivity loss of 2.2% nationally (FAO, 1986, cited in Shiferaw and Holden, 1998). Devereux (2000) sums up the appalling scenario as follows: *"Pressure on the physical environment increases inexorably, with forest cover, grazing land, livestock ownership, soil fertility and even rainfall all decreasing in many areas."*

The HHs' case is no exception in this regard. The study area is one of the regions known for depletion of their biomass resources (Gemachu, 1994, cited in Adnew, 2000). The traditional fallowing practice has almost been abandoned. The practice of crop rotation is substantially declining and the farming land has expanded to marginal land and communal grazing land and the natural forest are on the verge of total disappearance.

At the same time, poverty is pervasive and deepening in the country, particularly in rural areas. The structural food deficit of the country is enormous. Ethiopia received 10 million metric tones (Mt) of food aid between 1984 and 1998, which on average is equivalent to 10% of the country's cereals production (Jayne et al., 2002). According to an optimistic estimate, 50% of the population in the country cannot meet their daily minimum nutritional requirements. When disaggregated, those living below the estimated absolute poverty line account for 52% of the rural population and 36% of the urban population (Government of Ethiopia, 1999).

The HHs is also known for its structural food deficit and exposure to regional and localised recurrent drought, the most recent one occurring in 2003. Hararghe has been receiving food aid almost every year since the great famine of 1984/85 in the form of food-for-work (FFW) programs (Save the Children Fund (SCF)/UK, 1996).

In short, the rapidly declining availability of agricultural land, both in quantity and quality, against sustained population growth and continued reliance of almost all of the rural households on subsistence farming characterises the HHs as well as the other rural Ethiopia. Hence, in Ethiopia in general, and in the HHs in particular, ensuring food security of the rural households without compromising the long-run productive capacity of the renewable natural resource is the formidable challenge that the researchers, policymakers, development agents and farmers alike have to grapple with.

1.2 POPULATION-RESOURCE-WELFARE PARADIGMS

The brief overview of the Ethiopia's scenario in the preceding section with regard to population, environment and poverty seems to implicate a direct, simple and one to one cause – effect relationship. Most of the local scholars believe it to be so, for obvious reasons, with few exceptions. It is necessary at this junction to briefly have a look at the alternative perspectives on the issue in order to highlight controversial area needing further research and more case studies, and also to place the research in the proper theoretical perspective.

The relationship between population growth and food production, on the one hand, and population growth and environment, on the other hand, has been at the forefront of research and policy debate at least since Malthus published his extensively debated article in 1798 (Malthus, 1985). Since then, extreme views have been suggested regarding the population-environment-poverty nexus.

The classical economists and natural scientists strongly argue that the earth has limited carrying capacity and therefore can support only a limited number of people. Although this school recognises the role of exogenous technological change in increasing food production, it contends that increased food production would encourage more human fertility, re-creating the condition of poverty. Hence, uncontrolled population growth would inevitably lead to food and environmental poverty (e.g. Hardin, 1968). Population growth is accorded a regressive role leading to ecological deterioration through land fragmentation, deforestation, overgrazing, erosion, siltation, salination, soil acidification, etc.

Boserup, on the other hand, reversed the Malthusian hypothesis suggesting that it is population growth and increased subsistence requirement, not vice versa, that determine agricultural development in general and food production in particular (Boserup, 1965). Simon (1986) believes more people means more exchange of ideas that leads to advancement of knowledge and technology, and thereby, increased food production. Tiffen et al. (1994) also claim even under African circumstances population growth could lead to sustainable intensification. Similarly, Binswanger and Ruttan (1978) as well as Hayami and Ruttan (1985) hold the view that population growth would lead to innovation of increasingly labour-intensive technologies by

altering factor price ratios. Here population growth is accorded a progressive role: - increasing market size, changing factor proportions, inducing technological progress and creating demand for institutional change (e.g. land tenure) that reduce transaction costs and would lead to increased market efficiency.

Nonetheless, both the neo-Malthusian and the neo-Boserupian schools have failed to explicitly recognise the fact that the complex interaction between population, resource and welfare does not take place in an institutional, political and ecological vacuum. Institutional arrangement is a salient mediating factor of the linkages between rural demographic change and rural development (MacNicoll and Cain, 1990). This has led to the development of the third perspective that does not identify itself with any one of the polar Malthusian - Boserupian view. Instead, the latter perspective contends that the Malthusian trap or the Boserupian type response could be a possible outcome. The outcome is determined by an incentive structure, in terms of land tenure security, market and technology available to farm households and how that is influenced by policies (e.g. Panayotou, 1994), adding another dimension to the debate. For instance, the most recent study on the relationship between global food production and population growth concludes: "*technological optimism and ecological pessimism are both misguided*". (Gilland, 2002:61).

To summarise, all the alternative perspectives are important, but none of them, standing alone, is sufficient to explain the complex and dynamic interaction between population, resource and welfare. For this very reason, Lipton (1990) argues that the theoretical perspectives often seen as competing and with different policy implications are indeed complementary. Hence, only case studies guided by a broader analytical framework that systematically integrates the alternative perspectives provide more reliable and useful information for situation specific policy formation and implementation.

1.3 DEFINITIONS AND DELIMITATION OF THE RESEARCH PROBLEM

The population-resource-welfare nexus debate is controversial as apparent from the foregoing discussion. At the national level, most scholars, following the Malthusian line of argument, blame Ethiopia's food and environmental poverty primarily on population pressure (e.g. Belay, 1995; Seyoum, 1996; Tegegne, 1996), while few

others (e.g. Rahmato, 1996; Singh, 1998) make non-demographic factors at least equally responsible. Land tenure, market, technology and the presence and effectiveness of grassroots level institutions for the sustainable management of common property regimes are among the non-demographic factors.

In fact, there is no convincing evidence in the literature that indicates if SSA's population ceases to grow, either income per capita will automatically increase or/and sustainable natural resource management (NRM) is guaranteed. To the contrary, SSA's economy will continue to decline unless the economic stagnation is reversed even with zero population growth rate (Sen, 1994).

Moreover, international experiences indicate the possibility of natural resource degradation under different demographic scenarios: - increasing, declining and without population pressure (Blaikie and Brookfield, 1987). Empirical studies in SSA have further provided cases of sustainable rural livelihoods improvement as well as both rural livelihoods and natural resource impoverishment with increasing population pressure on the land (see Templeton and Scherr, 1997). Surely, as Jolly and Torrey (1993) conclude, research in this area has not yet led to a body of knowledge on which public or scientific consensus has developed. The debate is not yet over.

The fundamental reason for the divergent views is that there is no simple and straightforward relationship between demographic change, human welfare and sustainability. Implications of rural demographics for human welfare and the sustainability of NRM are influenced by a host of institutional, political, technological and agro climatic (climate, soil type, and slope characteristics) factors. The relationship between income and environmental pressure varies within countries and even across households (Hunter, 2000). According to MacNicoll and Cain (1990), implications of different agrarian systems, within a country, for the pace of productivity change, for labour absorption and for income distribution is different. It is possible to have both a positive and a negative correlation between population density and the quality of NRM in a country as reported by Rahmato (1996) for Ethiopia. A very recent study in southern Ethiopia further observed that the pathways of environmental and livelihoods change are different across agro-ecological zones and across households with different resource endowments (Konde *et al.*, 2001).

Similarly, Murton (1999) found sustainable intensification on richer farms and 'involution' on poorer farms, proceeding side by side within a village in the highly publicised case of the Machakos District of Kenya.

If these claims are indeed acceptable, generalisation based on aggregate studies is imprecise and less insightful. However, most of the studies, including those reviewed earlier, have emphasized aggregate or macro level (international/national) investigation with little attention to dynamics at household and community level. Besides, most of the studies failed to explicitly account for the role livelihood diversification into off-farm/non-farm can play to absorb additional labour and possibly to reduce pressure on the natural resource. Studies at such level overstate, understate, or misrepresent the impact of demographics and could lead to inappropriate policy recommendations (Panayotou, 1994). Decisions concerning fertility, use of the local natural resource base are reached at and implemented within households, but the interface of population, natural resource and welfare at a spatially localised level has been a relatively neglected subject in empirical analyses in rural development (Dasgupta, 2000).

Context specific policy, technological and institutional solutions are required to ensure sustainable rural development in circumstances of diverse local situations. Designing and implementing context specific development strategies that integrate livelihood needs of the local people with sustainable NRM, in turn, calls for a thorough understanding of alternative livelihood strategies of the rural households (Jabbar *et al.*, 2000). Empirical evidence from northern Ethiopia indicated that resource and welfare outcomes of rural demography are different across different livelihood strategies (Pender *et al.*, 2001).

> *"It is very important that preconceptions about what the poor do- what there livelihood strategies are- should be put aside. It has been common in the past to make untested assumptions about the poor, and as a consequence, to misdirect support." DFID (Department for International Development), 1999: DFID's facts sheet 2.5:2*

It is against this background that the research was initiated to understand and explain livelihood strategies of rural households and communities in the HHs in the context of

increasing population pressure to address the existing knowledge gap in this regard. Rural households are neither undifferentiated nor passive victims; it is generally accepted that they adapt to the changing resource base and opportunities in a variety of ways in order to enhance or protect their livelihoods. Households' livelihood strategies may involve changing the land use strategies, diversifying livelihoods to off-farm and non-farm and changing demographic behaviour (migration and fertility) in response to the dwindling local natural resource base to mention, but a few.

Livelihood strategies pursued by rural households and rural communities could be effective in ensuring both food security of the households and the sustainability of NRM. For example, the reduction of fallowing practice as soil fertility maintenance as a result of continuous cultivation under increasing population pressure could, with a commensurate increase in the use of chemical fertilisers, manure and agro-forestry practices, increase production to feed the increasing mouths without necessarily causing soil fertility depletion. Also the demographic behaviour of rural households might not be as rigid as we usually think. For instance, a study in Nepal found that the increasing environmental scarcity lowered the demand for more children at household level (Loughran and Pritchett, 1998, cited in Dasgupta, 2000). Nonetheless, if increasing environmental scarcity means reduced availability and accessibility of water and fuelwood, this may increase demand for girls' labour, reducing their participation in schooling with negative repercussions on fertility decline (Cleaver and Schreiber, 1994).

Alternatively, the gradually evolving indigenous strategies may fail to sufficiently cope or totally breakdown, with the fast increasing demographic pressure. In this circumstance, the natural resource base could be compromised and thereby poverty-degradation cycle could be exacerbated as a result of households' desperate quest for survival, particularly in the absence of effective external intervention.

External interventions and the broader institutional and policy context may influence households' livelihood behaviour and thereby the quality of NRM. Smallholder farmers need appropriate technology, market incentives, access to investment capital and assurance that they would reap benefits of their investment in land improvement in the medium to long-term to pursue a sustainable intensification path. External

intervention could augment assets needed for sustainable rural livelihoods such as labour (through training, health and nutrition) and natural resource base through provision of irrigation infrastructure, investment in soil and water conservation, etc. Conversely, ill-conceived external interventions or appropriate, but ineffectively implemented external interventions could constrain local response and possibly have negative repercussions on rural livelihoods and the sustainability of NRM.

Rural institutional arrangements such as family formation and inheritance systems influence the extent of disparity between private and social costs of reproduction and perceived incentive to pursue socially desirable demographic behaviour at household and intra-household level (MacNicoll and Cain, 1990). In other words, 'externalities' may be created in reproductive choices. Furthermore, lack of effective institutional arrangements or collective action at the grassroots level to control access to communal forest, grazing land and water resource could lead to degradation.

The central concern of the thesis is, therefore, to uncover these possible sources of tension at household and community levels in order to inform policy and development interventions at regional and national level. Yet, it should be clear at the outset that it was not the intention of this research to test specific hypotheses or formally establish cause-effect relationships between demographic change, human welfare and the quality of the natural resource management. The thesis had two modest objectives: 1) to understand what it is that rural households and communities in the HHs are doing to protect and/or improve their livelihoods in the context of the fast declining cropland area per capita and per household, and the prevailing institutional, technological, policy and physical environment; and 2) to assess whether the sustainability of NRM is compromised in the process.

1.4 SPECIFIC OBJECTIVES OF THE RESEARCH

The overall objective of the research is to understand, assess human welfare outcomes and highlight sustainability implication of, rural livelihood strategies pursued at household and community level in the Hararghe Highlands in the context of the growing population pressure and the prevailing broader institutional and policy context, and the physical environment. The specific objectives of the research were:

1. to critically review the evolution and salient features of institutional and policy environment of the country in order to be able to understand whether it facilitates or constrains the realisation of sustainable rural livelihoods at the grassroots level in the subsequent analyses;
2. to develop and describe rural households' typology in order to examine diversity in livelihood behaviour in the subsequent analyses;
3. to identify and describe land use strategies pursued at household and community level;
4. to investigate the nature, the extent and determinants of livelihood diversification and the role of reduced access to land in the households' diversification decision;
5. to explore whether and to what extent households' family size preference or achieved/intended fertility is responsive to the increasing natural resource scarcity, cropland in particular;
6. to assess human welfare outcomes, in terms of food security status, of livelihood strategies pursued by households; and finally
7. to highlight sustainability implications of livelihood strategies pursued at household and community levels.

1.5 RELEVANCE OF THE STUDY FOR RURAL DEVELOPMENT POLICY AND PRACTICE

It is generally accepted that one of the reasons for failure of many rural development initiatives in SSA at macro level is the inadequate attention and recognition given to local level specific circumstances and initiatives in solving development problems (Taylor and Mackenzie, 1992). Detailed understanding of intricacies, strengths and weaknesses of rural livelihood systems and the aspiration of the concerned rural people is imperative if past failures are to be avoided (Binns, 1995). The linkages between local livelihood strategies and the macro institutional and policy context deserve equal attention. Rural poverty reduction strategy should reinforce local strategies that are sustainable. Therefore, we have recently witnessed a paradigm shift away from macro policies towards micro policies and interventions at village, household and individual level (Ellis, 2000b).

This study contributes to the shift in analysis and action. It provides insights into livelihood strategies of the rural households and communities; assesses welfare outcome; and underscores the major implications of local strategies for the sustainability of NRM in the HHs. Such information is needed to enrich the debate on what would be the appropriate rural development strategy, for the study area and the country at large, that strengthens successful local strategies and provides an enabling environment for sustainable rural livelihoods.

The research is also timely. The Ethiopian government is currently engaged in formulation of a 'National Poverty Alleviation Strategy'. At the heart of the 'Poverty Alleviation Strategy' being debated by the academics and the public at large is as to how to realise sustainable rural development. The respective regional governments would subsequently adapt the details of the national strategy being designed to their local specifics. The insights this research is expected to provide may be a useful input to such initiatives in the country in general and in the Oromia Region in particular.

Moreover, the research represents, to the researcher's knowledge, the first attempt in the HHs, and possibly in Ethiopia, to conduct such a comprehensive analyses of population, resource and welfare interface at spatially localised level. The research used rural livelihoods approach and borrowed concepts and theories from agriculture economics, natural resource management, economic demography and rural sociology.

Most importantly, the research may challenge the current sector-based approach to rural development in the study area that assumes farming to be the only livelihood option for rural households; it thus focuses on increasing efficiency of smallholder agriculture in order to achieve food self-sufficiency while neglecting household level food security and the emerging off-farm and non-farm sector as a potential alternative source of employment and income. It may also challenge the current uniform, untargeted rural development interventions amidst diversity in resource endowments, and as a consequence, diversity in livelihood strategies across households and communities.

In short, the livelihood analysis is expected to identify livelihood related opportunities and constraints; it may also provide local insights and identify the priorities of rural households that inform higher level policy; and may explain how the prevailing structures and processes affect rural livelihoods at the grassroots level. The latter may, in turn, provoke discussions and consultations on how to support sustainable rural livelihoods and mitigate adverse welfare and environmental consequences of unsustainable livelihood strategies.

1.6 CONTRIBUTIONS OF THE RESEARCH TO THE KNOWLEDGE AND INSIGHTS INTO RURAL DEVELOPMENT PLANNING

As indicated earlier, the investigation was conducted with the ultimate aim of enriching the current debate on what type of institutional innovations and development interventions would be needed to support sustainable rural livelihoods in the study area in particular and in the country at large. However, the current study also contributes to the methodological approach in studying rural development problems.

The research is carried out for the higher research degree in rural development planning, and the nature of the problem itself requires a multi-disciplinary approach. Hence, the thesis embarks on an effort to systematically integrate alternative perspectives regarding the population –resource –welfare nexus, and relevant issues and concepts from agricultural economics, natural resource management, economic demography and rural sociology. It then demonstrates the practical application of the comprehensive framework for analysing rural livelihoods in the context of population pressure on a case study basis. In the process, the thesis constructively contributes to the debate on the 'Sustainable Livelihood Framework' (SLF), while suggesting a more practical approach.

There is a tendency in practice to apply the SLF in a static manner. A simple enumeration of livelihood activities as farm and non-farm, and indicating income contributed by each activity is inadequate. There is a need to go further to uncover how each activity is done and why people do the activity the way they do it. Whilst investigating farming as a component of rural livelihood strategies, for instance, one should be prepared to go further to examine the prevailing land use strategies and

how they have evolved over-time. This is more insightful than halting the analysis prematurely after dividing farm strategies into cash crop production, subsistence crop production and livestock-rearing activities, and indicating income from each activity. There is a need to investigate the motives and consequences of land use strategies, say a shift to the production of high-value crops such as chat, in detail. Besides, historically, demographic adjustments such as migration, delayed marriage and fertility control within marriage have always been part of rural strategies in the face of demographic pressure. Although temporary migration is treated as a component of livelihood diversification strategies in the SLF, permanent migration and fertility issues are overlooked in the SLF. Furthermore, the SLF makes the research agenda open-ended, and thus costly and unmanageable. The theoretical background and analytical skills required to understand all aspects of rural life simultaneously is such that a research guided by the SLF would likely result in a superficial analysis, and a package of policy recommendations without priority and sequence. The framework for analysing rural livelihood strategies in the context of population pressure, which is developed and applied in this thesis, is therefore relatively more comprehensive, yet specific for a practical application.

The current study also reverses the conventional way of looking at the research problem. The population –resource –welfare interactions are studied at spatially localised level since the ultimate decisions concerning fertility and the use of the local natural resource base are reached at and implemented within households and communities. The rural households are deliberately put at the centre of the analysis. Thus, unlike other similar studies, the current study does not start from the identified 'problems' (fast population growth, natural resource degradation and food insecurity). Rather, it looks into the livelihood behaviours of the rural households and communities (their decision making processes, their priorities, motivations behind their decision, their livelihood strategies, etc.), and how local livelihood strategies are influenced by the macro institutional and policy context. It then looks at the issues of food security and natural resource management as rural livelihood outcomes.

Furthermore, the thesis deliberately puts the neglected issues of diversity and rural differentiation in development studies in SSA in general, and in Ethiopia in particular, at the centre of the analysis. To this effect, the qualitative and quantitative techniques

of developing a typology of rural households (wealth categories) are combined and used in an innovative way.

1.7 AN OVERVIEW OF THE STUDY REGION

1.7.1 PHYSICAL AND SOCIAL SETTINGS

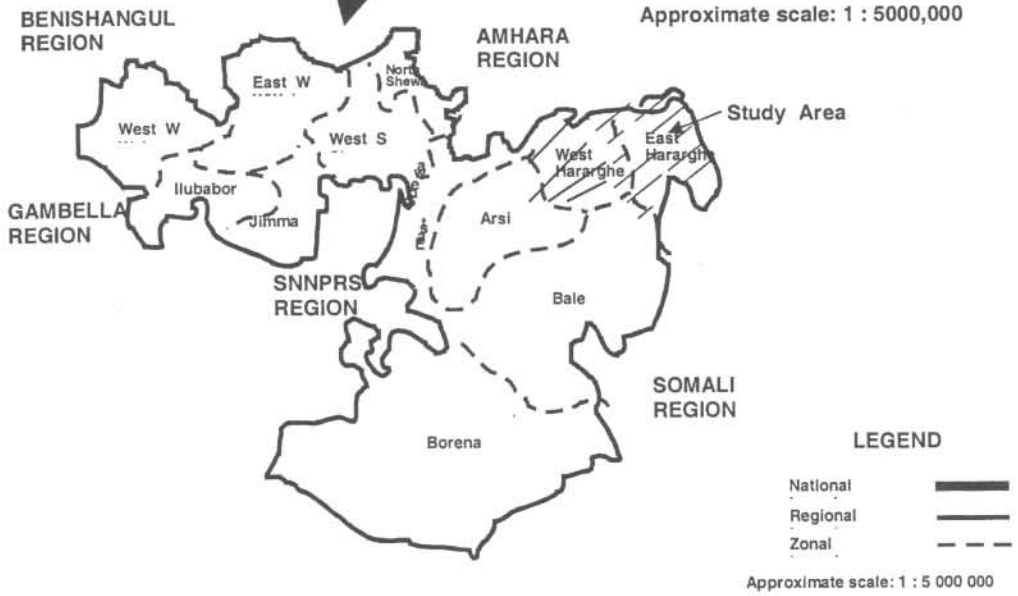
The Hararghe region consists of the East Hararghe zone and the West Hararghe zones of the Oromia region. It is located in Eastern Ethiopia (map 1A). Geographically, the region is located south of Djibouti and west of Hargessa town of Somali at about 300 kms and 250 kms, respectively (Klingele, 1998). The Ethio-Djibouti railway passes through the region and air transport links the region to Djibouti, Hargessa and the capital Addis Ababa. There is a gravel road; being upgraded to concrete asphalt, linking the two zones in the region to the capital, Addis. This gives the region a relatively better transport networks in the country.

The majority of the Hararghe population (83%) lives in the countryside and depends on farming (highland and midland) and livestock rearing (lowland) for its livelihoods. The rural population of Hararghe is predominantly Oromo in ethnic origin and Muslim in religion. The other ethnic minorities' population living in the region include the Amahara and, the Afar and Somali pastoralists. Extended family is the common type of family structure and polygamy is common among the Muslim Oromo. However, polygamy is less common among the Amaharas and the Christian Oromos who migrated to the region from the north and the Central Highlands of the country in the late 19th century.

Agro-climatically, Hararghe encompasses highlands (15 - 20%), midlands (35 - 45%) and lowlands (30 - 40%) with altitude ranging from 1000 to 3405 meters above sea level. Annual average rainfall ranges from 700mm in the lowland to nearly 1200mm in the upper highlands. Hararghe gets biannual rainfall, the *belg* (short rain) from end of February to the middle of May and the *meher* (long rain) from July to end of September.

MAP 1A:
REGIONAL STATES OF ETHIOPIA

MAP 1B:
OROMIA REGIONAL STATE
Approximate scale: 1 : 5000,000



Land preparation for the long cycle crops, sorghum and maize, is carried out during *belg*. *Belg* rain also allows limited production of small cereals such as barley and wheat in midland and upper highland. *Meher* is the main season for farming activities. While the average precipitation is generally considered adequate for viable rainfed agriculture, its abnormal distribution and amount exposes crops to frequent weather hazards (Storck *et al.*, 1990).

1.7.2 CROP AND LIVESTOCK PRODUCTION

Sorghum is the staple crop in the region followed by maize. Sweat potato is extensively cultivated during unfavourable season (season of low rainfall or abnormal distribution of rainfall) to cope with food insecurity (Kingele, 1998). Small cereals such as tef (*Eragrostis tef*), barley, wheat and millet are produced in the West Hararghe highland. Legumes such as horse bean, and haricot bean are grown usually intercropped with maize and sorghum. The staple crops are mainly produced for home consumption, with the exception of teff. The staple crops are sold only where cash crop production is limited to cater for cash needs of the households in cereal - dominated areas.

Chat (*Chata edulis*), a mildly stimulant leaf or shrub chewed fresh by the people in the Horn of Africa and some Arab countries is the most important cash crop with growing importance in terms of resources committed to its production, the cash it generates and its multiplier effect on the local economy. It enjoys a growing domestic and export markets, is less affected by diseases and earns stable income though heavily taxed. On the contrary, coffee is the traditional cash crop with declining importance. The chief reasons are severe problem of coffee berry diseases (CBD) and declining world prices despite exceptional quality of Hararghe coffee. Hence, it is being replaced by chat in the HHs. It retains its importance only in certain pockets of the West Haraghe Zone such as the Boke District, which is known for its exceptionally favourable agro-climate for coffee production and far from the main road network. The production of chat requires proximity to the road networks since it has to be fresh when it reaches the ultimate consumers, both domestic and foreign. Vegetables such as onion, cabbage, carrot and root beet are also produced as cash

crops mainly for export to Djibouti. However, their commercial production is limited in irrigated valleys of the East Hararghe zone.

Livestock constitutes an integral part of the farming systems of the HHs. Livestock is the source of draught power, cash, soil nutrient (manure), milk and means of accumulation. For the lowlanders it is their main source of livelihood. Development of the livestock sector is constrained by drought in the lowland and diminishing grazing land in the midland and highland of the region.

1.7.3 LABOUR RELATIONS AND METHODS OF PRODUCTION

Land and labour constitute the major resources of the farm households and it is land that is the most limiting factor (Storck, et al., 1990). Hararghe farmers, like their counterparts in the other parts of Ethiopia, have only usufruct rights over the land they cultivate. Ethiopia's farmers are organised at grassroots level under Peasant Associations (PAs). The responsibility of PA includes periodic rural land redistribution and land administration. However, land redistribution has effectively been phased out and there is no extra land to be distributed by PAs. Practically, all the available land has been put under cultivation. Inheritance is the only means of access to land for new entrants in the farming activity. In fact, the possibility for sharecropping and/or leasing land is open though limited.

Mainly family labour is used for agricultural activities. Local labour organisation called '*guuza*' and '*faraqaa*' are also used to mobilize additional labour during peak season. Men carry out field activities such as land preparation, weeding and harvesting. Women are mainly responsible for household chores and feeding animals especially cows and small ruminants. Women also assist their husbands during harvest in case of labour scarcity (Storck *et al.*, 1990). Marketing of dairy products, perishables and chat in small quantities are also within women's domain. Of course, men who are heads of households carry out marketing of chat and perishables in large quantities. Though men seem to dominate resource allocation decisions, there is evidence that wives are consulted (Emana, 2000).

Herding and scaring of birds and monkeys are the duties of children. Children assist their mother fetc.hing water, collecting fuelwood and looking after their young

siblings. Older children assist their father ploughing, weeding and harvesting (CARE-Ethiopia, 1995b). This indicates that children are important sources of labour at their early age. The children's labour service obligation is also extended to blood relatives effectively making children a group asset and childbearing social responsibility (CARE-Ethiopia, 1995).

In the region, oxen and bulls are widely used for land preparation. Draught power per household or arable land has declined dramatically due to diminishing grazing land. A hand hoe made of a stick with a metal point locally called '*dongora*' is used in the absence of a pair of oxen for land preparation. The extent of application of improved crop and livestock husbandry practices varies from place to place.

1.8 THE SURVEY AND DATA

1.8.1 SAMPLING PROCEDURE

Conventionally, random sampling which gives each and every item in the entire population equal chance of being included in the sample will result in a sample that better represent the population. The exact sample size can be determined statistically based on certain critical parameters at an acceptable level of probability (Leedy, 1997). However, very often researchers make practical decisions about sampling method and sample size based on the scope and objective of their enquiries and resource availability (Kothari, 1994).

In this study, a multistage sampling, a combination of purposive and stratified systematic random sampling, procedure was followed to select the study sites and the sample households. First, three representative study sites were selected purposely and then sample of households was drawn using proportional systematic random sampling technique. The proportion of female-headed households in the total population of households at each selected study site was obtained from households lists provided by respective PAs for the proportional sampling.

A study by an NGO (CARE-Ethiopia, 1997, cited in Klingele, 1998) categorises the study region into five economic systems as a basis for food risk mapping. These are:

- Cereal major system
- Cash crop major system

- Cereal and cash crop major system
- Agropastoral (livestock major and cereal minor) system
- Pastoral system

The agropastoral and the pastoral systems were not considered for selection of the study sites since the study is limited to the highlands. Then, three sites were selected purposely based on the diversity of the economic systems of the HHs, the extent of population pressure as perceived by the local Ministry of Agriculture (MOA) staff and accessibility during the rainy season. These sites are Alemaya, Kuni and Sabale. These sites are dispersed over three districts in the two zones and at least two PAs from each site were included in the study. The local extension agents or leaders of Peasant Associations (PAs) provided lists of households at each site. The households were then stratified according to the gender of households' heads and proportional sample (in order to include female-headed households) was drawn from the lists by the systematic random sampling technique.

Table 1.2: Peasant associations and districts covered by the study

Peasant Association	District	Zone	Number of sampled households
Finkile	Alemaya	E. Hararghe	30
Fendisha Lencha	Alemaya	E. Hararghe	22
Gobe Selama	Alemaya	E. Hararghe	27
Kuni Segaria	Chiro	W. Hararghe	35
Walargi	Chiro	W. Hararghe	18
Sabale PA-1	Kuni	W. Hararghe	37
Sabale PA-2	Kuni	W. Hararghe	28
Total			197

The total sample size at the beginning of the study was 225. Seventy-five households (just over 10% of a PA's population on average) were randomly selected from each site. However, some households lost interest and withdrew their cooperation due to 'interview fatigue' during the second or the third phase of the survey. Some others did not give complete information that could be utilized for the analysis. This brought the final sample size down to 197 households. Nevertheless, the study was quite successful in terms of encompassing different categories of farmers- the better-off and the poor, male-headed households and female-headed households, young and old and, Muslim and Christian were all fairly represented. Therefore, reasonably representative information in terms of the categories of households and the economic

systems was obtained to develop livelihood typology and to examine similarities and differences across sites and among different households. Nonetheless, there could be some degree of sampling bias since the sample size is small and accessibility was one of the criteria used to choose the study sites. The bias is not all significant, and has a very little influence on the analysis and the conclusions drawn.

1.8.2 DATA AND DATA COLLECTION METHODS

Taking into account the objectives of the investigation and the conceptual framework that has been adapted to the purpose of this research (Chapter 2), the primary data was collected on the following variables:

- Household characteristics such as size, age, sex, education, religion and household members relationship to the household head.
- Households' livelihood assets such as land and its quality, number and type of livestock owned, farm implements, house type, tape and/or radio ownership, labour and its quality in terms of age, sex, education and health status, savings and grain in store.
- Access to soft and hard infrastructure such as education, health and family planning, irrigation, market, extension, credit and improved inputs.
- Livelihood activities such as food and/or cash crop production, livestock rearing, forestry, off-farm and non-farm activities.
- Soil and water conservation practices.
- Gender division of labour and decision-making.
- Constraints in respective areas of activities.
- Production, sale, purchase, income and grain available for consumption.
- A once-off anthropometric measurements- age, sex, height, and related data.
- Data related to fertility and migration.

The fieldwork was conducted from mid of March 2001 to mid of January 2002. Both the conventional sample survey methods and participatory methods were used in a complementary way to collect the required data. Two rounds of questionnaire surveys, once-off anthropometric measurements, one round of group discussions, personal observation, case studies of selected households and focus group discussions were undertaken.

Sets of structured questionnaires administered by enumerators under the close supervision of the researcher and a trained field assistant was used to collect detailed quantitative data. The questionnaire was pre-tested as part of enumerators training in the field. Adjustment was then made to the questionnaire based on feedback obtained from the pre-test exercise and a review of the literature on farming systems of the study area. The responses were obtained from all relevant household members, i.e., not only from household heads. For example, wives provided information related to family planning. Female enumerators were used to avoid communication barrier while interviewing women. Through out the fieldwork, every sample household had been visited at least five times.

A Public Health Officer from the Faculty of Public Health at Alemaya University provided technical assistance in the execution of once-off anthropometric data collection. This survey also provided an opportunity to visit each and every sampled household. It was during this time that case studies of selected households were carried out.

Group discussions at each research site, attended by representatives selected from both the sample and non-sample households, were in fact used at the exploratory stage of the fieldwork. The group discussions, summarised in a field notebook on the spot, gave important insights into a number of community level issues. Among others, insights were obtained on the general picture of the prevailing farming systems (resources, cropping systems, technology, yield, etc.) and changes happening over-time, general perceptions of problems and solutions and emerging livelihood strategies in each site. Participatory group wealth ranking exercises at each site were used to identify categories of farmers in terms of wealth and local wealth ranking criteria.

Oral historians and transact walks together with discussions with knowledgeable elders of the communities had helped to get an overview of change in the land use systems over-time at each research site. This was done due to the absence of time series data that relates to demography and land use. Qualitative information pertaining to fertility and gender relation was obtained through focus group discussion. Furthermore, supplementary secondary data was collected from NGOs,

zonal agricultural and planning offices, CSA, National Bank of Ethiopia, research reports and government policy documents.

Table 1.3: Summary of data collection methods

Data collection method	Type of data and purpose	Source
Questionnaire survey	Socio-economic date to test certain relations	Sample households
Nutrition survey	Once-off anthropometric measurements to determine nutritional aspect of food security status of households	Preschoolers, school-age and adolescents from the sample households
Case studies	Socio-economic data to describe certain facts and patterns such as the land use systems	Limited purposely selected sample households
Group discussions	Community level information to identify the prevailing livelihood strategies and understand local context at exploratory level, identify local wealth ranking criteria and get a limited data to use as a reference against which household level data are checked	Sample and non-sample Households
Focus group discussions	Fertility and gender related issues	Sample and non-sample
Review of reports, policy documents and publications	Secondary data to get general information related to the study and to be used for triangulation purpose	Banks, NGOs, zonal offices and universities

1.8.3 DATA QUALITY CONTROL MEASURES

One general concern about survey-based research in a subsistence farming area is data reliability. A number of factors, beyond the control of an investigator, could affect data reliability unless conscious efforts are made to minimise the error. In the study area suspicion, dependency, high level of illiteracy and non-existence of record keeping practices are the main problems.

First, the uncertainty related to land right, the peasant-government relations that historically based on forced surplus extraction, villagisation, cooperativisation and military conscript have made the Ethiopia's peasantry suspicious. An elder in one of the PAs covered by this study justified the prevailing high level of suspicion among the peasantry by saying, " a r*ope seems a snake in the dark to a person who saw a snake in the light."*

Second, limited number of households in some of the study sites had received grain and edible oil for free or through FFW programs. This experience has created a

certain degree of 'dependency'. This means some farmers were reluctant to cooperate when they learnt that immediate benefit was not forthcoming.

Third, keeping the record of inputs used and costs incurred in the production process, and recording produce, crop and livestock proceeds, off-farm and non-farm income is still remote to most of the Ethiopia's peasantry even in the 21st century. Besides, different members of the households partake in numerous small transactions throughout the year further complicating the issue.

Last but not least, the lack of any tangible improvements so far in the rural livelihoods as a result of external interventions has also created a certain degree of resentment among the peasantry. As a result, some households were at times reluctant to tell the truth, underestimate their resources and exaggerate their problems or even uncooperative. Nevertheless, these problems are not typical to the current research although professional correctness requires one to openly admit it. "*Rural people have learned from experience to keep some of their activities hidden, especially from government, which has a tendency to control, regulate or tax such initiatives.*" *(Taylor, 1992:)*

The necessity for taking measures to ensure reliability of the data by reducing the inevitable errors to an acceptable level was imperative. Data quality control procedure suggested and applied by Storck *et al. (1997)* in the same area was followed to this end. The procedure entails checking consistency and plausibility. The reported size of cultivated area was checked against plots allocated to different crops, amount of inputs used, such as seed and fertilisers. Balancing, such as cash inflow and outflow comparison was also carried out. Cash inflows and cash outflows cannot be stretc.hed without limit though not necessarily balanced (Storck *et al.*, 1997).

Triangulation, i.e., comparing information from different data sources, is another method used for data quality control. First, the group discussions conducted at the very beginning at each site had helped to find out the maximum, the minimum and the average conditions (holding size, milk production per lactation, yield and revenue from crop production with-and-without irrigation and/or improved husbandry). In

addition, secondary data from previous research, GOs and NGOs reports were also used for cross checking. In this way discrepancies and outliers were identified and corrections were made to improve the reliability of the data.

1.9 DATA ANALYSIS

The nature of the enquiry demanded both the qualitative and quantitative data. It then follows that both the qualitative and quantitative data analysis techniques were employed independently or in combination as deemed necessary. Verbal description, interpretation and appreciation of facts, highlights of household and community level case studies, and descriptive statistics form part of the qualitative analysis.

Multivariate techniques such as discriminant analysis, multivariate linear regression model and regression on limited dependent variable form part of the quantitative analysis. The discriminant analysis was employed to objectively confirm the number of socio-economic categories of the sampled households constructed through group wealth ranking exercise. The other advanced econometric models served to identify and test relative importance, in terms of statistical significance, of variables of interest. The underlying statistical and econometric theories of the chosen quantitative data analysis methods are briefly reviewed in the following section for the subsequent appropriate application and interpretation of the results.

1.9.1 DISCRIMINANT ANALYSIS

Discriminant analysis is one of the multivariate statistical techniques used either for interpreting differences among known groups or classifying subjects into groups on the basis of a set of measurements (Stevens, 1986). It is the appropriate statistical technique when the dependent variable is categorical and independent variable is metric (Everitt, 1991). It has been successfully used in studies of loan repayment risk analysis (Kebede and Kassa, 1998), in classifying farmers into homogenous groups for technology adoption studies (Emana, 2000) and many other studies in the social, medical and biological sciences. The equation takes the following form:

$$D = W_1 + W_2 + W_3 + - - - + W_n X_n$$

Where, D = is discriminant score;

W_i = discriminant weight for variable i;

X_i = independent variable i.

The multivariate discriminant procedure, like multivariate regression, drives a linear combination of independent variables that maximises between groups to within group differences (Anderson et al., 1958). The between to within group differences quotient is called eigen value and the larger its value the maximum the separation between groups or the maximum the discriminating power of the function under consideration (Stevens, 1988). Wilks' lambda, which is inversely related to Eigen value, and canonical correlation are used to test the significance of the discriminating canonical functions (Klecka, 1980). Canonical correlation, the value of which ranges from 0 to 1, measures the degree of relatedness between the groups and discriminant functions. Wilks' lambda, on the other hand, measures group differences over several variables. The value of Wilks' lambda ranges from zero to one; as an inverse measure, the smaller the value of lambda the greater is the separation between group centroids relative to within group dispersion. The percent of original grouped cases correctly classified by the model, taking into account prior membership probability, is used to assess the overall fit of the model (Anderson et al., 1958), like R^2 in the multiple regressions.

Generalised distance function, particularly Mahalanobis D^2 and group membership probability are commonly used for classification purposes once the number of groups and predictors are known (Klecka, 1980). Cases are classified into the groups with the smallest D^2 after calculating the squared distance for each group in the former, while in the latter, a case is classified into a group for which it has a highest probability of belonging. Both procedures are supplementary since classification based on squared distance assigns a case to a group that most likely resembles its profile (Klecka, 1980). The SPSS software package, based on Bayer's rule, classifies cases into appropriate groups using their discriminant scores. The probability function for classifying cases with given discriminant scores is given as follows:

$$P(Gi/D) = \frac{P(D/Gi)\,P(Gl)}{\sum_{i=1}^{g} P(D/Gi)P(Gi)}$$

where, P(Gi) is the prior probability;

P(D/Gi) is the conditional probability;

P(Gi/D) the posterior probability; i = 1, - - - g are groups

1.9.2 MULTIVARIATE LINEAR REGRESSION MODEL

The multivariate linear regression model econometric specification is given as follows:

$$y_i = \delta_o + \sum_{i=1}^{m} \delta_i \chi_i + u_l$$

Where y_i = dependent variable

χ_i = explanatory variables

δ_o = intercept

δ_i = parameters to be estimated

u_l = disturbance term

OLS method is used for parameter estimation and the standard t and F statistics is used to test significance of individual variable and goodness of fit of the model respectively.

1.9.3 MULTIVARIATE LOGISTIC REGRESSION MODEL

Binary logistic regression model is a probability model frequently used when dependent variable assumes a value of zero or one (Aldrich and Nelson, 1984; Hosmer and Lemeshaw, 1989; Liao, 1994; Gujarati, 1998). It differs from the linear regression model in two aspects: 1) its conditional mean is bounded between zero and one; and 2) the error term follows binomial rather than normal distribution with mean zero and variance equal to P_i (1- P_i).

Although there are alternative probability functions, such as probit probability function, that can accommodate dichotomous outcome variable, logit probability function is usually preferred for its mathematical simplicity, flexibility and ease of interpretation. Hence, we opted for logistic regression based on the theoretical consideration and the nature of our dependent variables that assume the value of

one for favourable response and zero for unfavourable response. Mathematically, the logistic distribution function, following Gujarati (1998), can be specified as:

$$P_i = \frac{1}{1 + e^{-Z_i}}$$

where: P_i is probability of an event occurring and Z_i is a function of n explanatory variables (x) expressed as:

$$Z_i = B_o + \sum_{i=1}^{n} B_i X_i$$

For a nonevent, the probability is just one minus the event probability

$$1 - \frac{P_i}{1 + e^{-Z_i}}$$

Dividing probability of an event occurring with the probability of a nonevent occurring and further simplification will give us:

$$\frac{P_i}{[1 - P_i]} = e^{Z_i}$$

The ratio Pi / (1- Pi) is known as the odds ratio, i.e., the odd in favour of being in the category of interest. Finally, multivariate logistic econometric model is obtained by taking the natural logarithm of the last equation and by introducing disturbance term u_i.

$$Li = \ln \left(\frac{P_i}{1 - P_I} \right) = B_o + \sum_{i=1}^{n} B_i X_i + u_i$$

Where: b_i, the coefficient for the i^{th} predictor, estimates the change in log odds of being in the category of interest on the response for a one-unit increase in the i^{th} predictor, controlling for all other predictors in the model (Demaris, 1992).

Logistic regression parameters are estimated by a method called Maximum Likelihood Estimation (MLE) instead of OLS estimation as in the linear regression model. MLE produces estimates that are unbiased, efficient and estimates that follow normal distribution like OLS facilitating hypothesis testing. The only difference is MLE is nonlinear which creates computational difficulty and requires larger sample size (Aldrich and Nelson, 1984).

The Wald statistic that compares the maximum likelihood estimate of the slope parameter to an estimate of its standard error can be used to test statistical significance of individual predictors. Hosmer and Lemeshow's measure of goodness of fit (R_L^2) can be used instead of R-square in OLS although there is some disagreement among authorities (Field, 2000). Insight on overall performance of a logit model can be obtained from percent of originally grouped cases correctly predicted by the model.

1.10 LIMITATIONS OF THE RESEARCH

First, the scope of the research is broad and it is relatively less focused of necessity. The research attempted to comprehend rural livelihoods in its entirety like any other rural livelihoods analysis. It looked into natural resource endowment and use, level of technology, households' participation in the factor and product markets and, the extent and determinants of livelihood diversification. The study further investigated migration and fertility as an aspect of rural livelihood strategies and, evaluated welfare outcomes and underscored sustainability implications of livelihood strategies pursed at household and community level. The role of physical, institutional, technological and policy environment in shaping livelihood strategies at the grassroots level and influencing human welfare and sustainability outcome could not be overlooked either. While the livelihoods approach is superior in providing a coherent picture of the actual local circumstances, it is data intensive and requires multidisciplinary research. Therefore, a trade-off between analytical rigour and comprehensiveness is inevitable in research of this nature.

In the second place, two approaches are commonly followed in the empirical literature to capture responses to population pressure such as changes in the land use systems at village or higher level. Some researchers compare villages assumed

to be similar in different aspects such as altitude, cropping systems, land tenure, access to technology and proximity to the market, but population density or the multivariate regression method is employed where the number of sample villages are sufficiently large. Others use longitudinal data to understand changes resulted from growing population density over time. The researcher could find neither villages that were 'similar' in relevant variables and, at the same time, had significantly different population densities in the HHs, nor specific longitudinal data for the study sites that is ideal to understand the dynamics of rural livelihoods.

The non-existence of the most preferred type of data limited the analysis to cross-sectional household data though attempt was made to capture the dynamics of rural livelihoods through interviews using techniques such as subjective trend analysis and group discussions with knowledgeable elders of the communities and other key informants. Apparently, the insufficiency of cross-sectional household data in terms of empirical socio-economic evidence prevented a detailed analysis of household livelihoods and hence the determination of ideal development strategies. Particularly the analysis of change in the land use strategies under population pressure was partially based on stylised facts supported by limited case study materials and personal observation.

Thirdly, arguments related to the impact of institutional and policy constraints on rural livelihoods and sustainable use of the natural resource were based on arguments and logics well established in the rural development literature. It was found impractical and beyond the scope of resource and time bound Ph.D. thesis research, such as this, to test each and every relation empirically. Nonetheless, the information provided by related empirical studies carried by other researchers in the same area or in the country was used to substantiate certain arguments and make the discussions contextually relevant.

1.11 THE ORGANIZATION OF THE THESIS

The next chapter, Chapter 2, reviews the concepts, the theoretical perspectives and empirical evidences related to the main themes of the thesis. It develops an appropriate conceptual framework for analysing rural livelihoods in the context of population pressure. Chapter 3 critically, but briefly, reviews the evolution and salient

features of the broader institutional and policy environment in Ethiopia. This helps to better understand how and to what extent institutional and organisational factors constrain or facilitate the achievement of sustainable rural livelihoods at the grassroots level. Chapter 4 deals with the description of the economic systems of the study sites and socio-economic characteristics of the sample households. It provides the basis for establishing homogeneous spatial units and presents household typology as a starting point for the subsequent analyses.

Results of the analyses, qualitative and quantitative, of rural livelihood strategies in the HHs (the land use systems, livelihood diversification and, migration and fertility) in the context of diminishing arable land area per household and per capita are presented in Chapter 5. Chapter 6 is concerned with determining human welfare outcome, i.e., food security status of rural households, and highlighting sustainability implications of livelihood strategies pursued at household and community levels. It then revisits livelihood strategies and livelihood outcomes in the HHs in an attempt to develop the major livelihood typologies for the study area in order to show the bigger picture.

Finally, the thesis will wind up by summarising the focus, the research method and the major findings of the research, and by drawing certain conclusions and recommending interventions that may need to be made in order to realise sustainable rural livelihoods in the HHs in Chapter 7.