ECONOMIC VALUE OF CHILDREN AND SOME CORRELATES AND DETERMINANTS OF THE DEMAND FOR CHILDREN: AN EMPIRICAL STUDY FROM NORTH-WESTERN ETHIOPIA

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Abstract

The search for the factors affecting fertility has been given great attention with the hope that the outcome may help in formulation and implementation of population policy. To this end, several factors have been investigated by many researchers. Among such factors, the value of children in general and economic value of children in particular is believed to play an important role. It is believed that the value of children is interrelated with fertility behavior. Along this line, the search for the factors affecting economic value of children and its linkage with fertility behavior is the main theme of this paper.

The study has attempted to make use of parental perception of the economic value of children and it tries to explore its relationship with some socio-economic and demographic variables. The data used in this study is collected using sample survey from three different areas of Gonder region, which is located north west of Ethiopia. The survey was conducted during the month of April, 1993. The target population comprises individuals with child bearing experience and still with the possibility of having a child.

The results of the study revealed that parents perception of economic value of children vary significantly with socio-economic and demographic variables. The study has also attempted to explore some correlated and determinants of the demand for additional children. It is found that, generally, socio-economic and demographic variables have similar effect both on the economic value of children variables and indicators of the demand for children. The study concludes by identifying variables that can have desirable policy implication towards lower fertility. It is indicated that taking measures to lower the value of children will create conducive situation to alter the attitude towards high fertility.

Chapter 1 INTRODUCTION

1.1 Introduction and Background

The issue of high population growth and its relationship with development has been in controversy for a long time. The views under this issue range from those who consider population growth as an obstacle to development to those who regard it as an engine for the betterment of human welfare.

As early as 1817 Malthus wrote an essay which strongly asserts the direct relationship between population and development (Hutchinson, 1967, UN, 1973).

Apparently, at present the consensus seems that high population growth is detrimental to development. Among the contemporary writers in this line, Brown and Jacobson (1985) expressed their view as follows:

> *In ...[LDC's] ...rapid population growth is becoming to overwhelm local life support system in many countries, leading to ecological deterioration and declining living standards. Once this deterioration begins, rapid population growth and ecological deterioration feed on each other, pushing countries into a demographic trap. In effect, ecological deterioration, economic decline, and political instability reinforce each other, confronting governments with the prospect of social disintegration [p5].*

Population trends in the least developed countries are indicating the possibility of further growth within the context of short and medium term time frame. This signalled international alarm so much that actions to control population growth have been taken over the last 20 years (Hess, 1980).

To a large extent, population activities seem to be inspired by a 'theory' which states, based on historical observations, that as the society develops both fertility and mortality which were high and balancing, during the pre-development era, decline, to almost equal, low level. But in between, there is a transition where mortality decline precedes the fall of fertility and thus resulting in a high population growth (Notestine, 1953 as cited in Greenhaigh, 1990).

The theory of demographic transition has been criticized for its inconsistencies (see for example Coale, 1973, 1984; Greenhaigh, 1990). There is also wide disagreement as to the force(s) which brought about the transition (Eberstadt, 1981; 47). Among the many factors cited as causes for fertility transition are changes in the role and status of women, advances in birth control methods, changes in the perception of mortality conditions, changes in social psychology and changes in the value of children (Nag, 1981: 284).

The direct association between fertility and level of development has been analyzed at two levels. At the first level, fertility and development are considered at country or community level (see for example Simon, 1976).

This approach considers aggregate fertility and aggregate socio-economic indices into analysis. In such studies the effect of fertility level on the welfare of the general community is discussed. That is, the value of children is studied from the aggregate social and economic perspective. The implications of such studies are more of macro-economic or structural in nature.

The second variant, which is relatively recent development, is concerned about the welfare of the family or the household in which a child is born. It tries to answer the question whether the family welfare is raised or dwindled as a result of the birth of a child. The benefits and costs of children to the household are the concern of the micro-level study. The outcomes of studies in this line are important to explore the gap between the micro and macro context of population related policy actions.

At macro level, the consensus is that high population growth rate, mainly due to high level of fertility, is not conducive for development. Thus, government and many other institutional organizations concerned with population have favored the formulation and implementation of fertility regulating policies.

However, there may not be a direct coincidence between individual household perception of the problems (claimed to be of paramount importance) of population growth and consequently the responses taken, and the assertion upon which macro population policy is based (Ruprecht, 1975). Kingslay Davis' 'Multiphasic Response' demonstrates the possibility of

diversified forms of perception of population pressure and the alternative responses to the perceived problem (as cited in UN, 1984). Parents may feel that having children is economically or otherwise advantageous (like emotional satisfaction derived from children, building or maintaining the keen group, etc.) while the government policy reflects that due to rise in public expenditures like education, health, and unemployment, etc., population control is of vital necessity. Thus, understanding the economic value of children at a micro level is important from the policy perspective.

1.2 The Problem

The economic costs and benefits derived from having children are some of the many factors that influence reproductive behavior. The distribution of costs and benefits among parents and other sectors of the community, i.e., the public or the society, will have their impact on the reproductive behavior. The costs and benefits associated with having a particular combination need to be examined in order to understand some of the important population policy variables.

In many parts of Africa a wide gap between knowledge and attitude as well as attitude and practice of birth control methods are found. In Ethiopia, several case studies and large scale surveys (eg. CSA, 1991) have shown that many eligible people know about birth control methods but only some proportion of them have the attitude to use it, and even among those with the positive attitude to use, only a few do really practice it.

In most African countries high value of children generally and economic value of children particularly, is hypothesized as a reason for the prevalence of sustained high level of fertility. This means better understanding of the value of children-fertility interrelationship is an essential question of policy oriented research. Therefore, understanding whether there is any variation in the value of children, the source of such variation (if any), its relationship with fertility behavior and, finally, the extent to which this is related with the macro fertility policy is vital.

1.3 Objective of the study

This study will attempt to explore the correlates of economic value of children. Basically it will have the following objectives:

(1) To examine the economic value of children to parents in different socio-economic groups.

(2) To explore the role of socio-economic variables on the demand for children and,

(3) To suggest possible policy implications for regulating fertility behavior.

1.4 Conceptual Framework

The concept of value can be defined in a broader term as "anything good or bad or anything of interest to a human subject" and in a narrow sense

it can be considered as "conception of the desirable, influencing selective behavior" where desirable refers to "what we ought to desire" (Williams, 1968; 283).

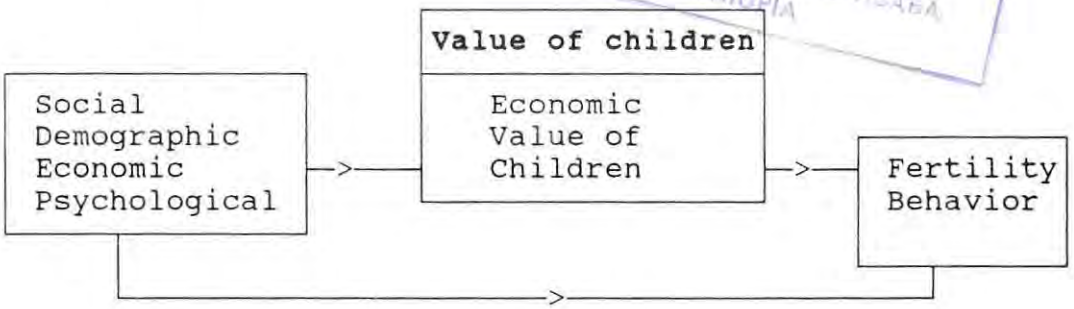
For the purpose of this study, the value of children is broadly divided in to economic and non-economic values. Non-economic values refer to emotional costs and benefits, self enrichment and development, maintenance of family name, family cohesiveness, continuation of the kin, maternal health and physical demand of childbearing are few among the long list of values of children given by Arnold and et al. (1975). The concern of this study is economic value of children as it refers to physical, material and financial transactions involved in child rearing between parents and children as perceived by parents. This is so just for the simple reason that it will be very wide to consider both forms of value. In addition, economic value, due to its objective form, is a more appropriate policy derivations.

Concerning the economic benefits of children to parents, two basic categories can be identified. These are (1) children as source of labour and (2) children as a source of material and financial support (Butz and Stan, 1982; 92: Schultz, 1973).

The cost of children is treated as an integral part of the value of children. It is important to make simple distinction of economic costs from non economic costs (Bulatao, 1982). Broadly speaking economic costs of children are classified into direct costs and indirect costs. Direct economic costs refer

to expenditures on children on food, clothing, education, medication etc. while indirect costs refer to opportunities foregone (largely economic) due to children.

The unit of analysis of this study is an individual parent. The analytical framework of the study is a simple expression that express value of children both as intermediary factor influenced by socio-economic and demographic variables and which in turn affect fertility behavior. When considered as dependent variable it is taken as a function of socio-demographic or background factors [like education, occupation, income, achieved fertility (parity) etc. of the parents]. When it is considered as independent variable it explains the variation in fertility behavior. Thus, analytical framework is presented in the following diagram:



In the above framework the variation of fertility behavior is to be explained by two factors. The first source of variation is due to the relationship between fertility behavior and value of children. The second source of variation is the effect of socio-demographic variables on fertility behavior independent of value of children. The full explanation for the variation in fertility behavior is to be provided by supplementing the independent effect of socio-demographic factors on fertility behavior and on

the effect of value of children. However, in this study only the relationship between factors indicated in the first box and the second box, and the first box and the third box are investigated directly while the third relationship, between the second box and the third box is treated indirectly through logical discussion.

1.5 Hypothesis

The following major hypothesis will be tested: The economic value of children is dependent on the socio-demographic variables, i.e., the economic value of children is related to the socio-economic condition of parents. Therefore, the higher the socio-economic status, the lower the value of children to parents.

Under the above general hypothesis follows a series of exploratory search for the major components of economic value of children and their correlates in social, economic and demographic domain. Specifically:

(1) The higher the disposable income of the family the lower the economic value of children and thus the lower the demand for children;

(2) The higher the level of education of the parents the lower the economic value of children and thus the lower the demand for children;

(3) *Urban residential experience has a negative effect on the economic value of children;*

(a) *In urban areas the economic value of children is low, the cost of children is high, therefore, parents prefer to have fewer children*

(b) *In rural areas the value of children is high, the cost of raising children is low, thus, the desire for children is high.*

(4) *There is sex differential in the economic value of children. Specifically males than females attach high value for children due to the gender biased differential in the cost and benefit of children against females.*

1.6 Review of the Related Literature

The study of value of children has been both old and new. It is old when studies of the value of children to the general welfare of the society are concerned. It is new in the sense that the value of children to parents has become the subject of inquiry only recently (Urquidi, 1977).

The approaches to the study of the value of children to parents or households, according to Fawcett (1979) are classified into four categories. These approaches are (1) social demographic, (2) social structural, (3) micro-economic and (4) social-psychological.

In the social demographic approach the change in the value of children is considered as a partial explanation for demographic transition. In this approach a very general definition is usually used to define costs and values of children and attempt is made to link it with socio-economic and demographic factors particularly fertility (Scrimshaw, 1981).

In the socio-structural approach heavy emphasis is placed upon the political economy of fertility (i.e, the production of children and the process of bearing and rearing them) and its determinants. The major instrumental variables in this approach are opportunity costs, status of women and role incompatibility (Kasarda, Billy and West, 1968, Fawcett, 1977, McNicoll, 1980). Here individuals' choices are assumed to be highly subjected to social structural changes (Fawcett, 1977, Simmons, 1985: Airds, 1981). Thus, it does not provide explanation for the variation in reproductive behavior within the same social structural groups. It also fails to work if the change in social structure are relatively small (probably over a short period of time).

The micro-economic approach begins with the proposition that reproductive behavior, specifically fertility is subject to parents decision (conscious or unconscious) based on the economic costs and values of children, during their course of allocating the family's available resources (Simmons, 1985 : 34-35). The pioneer work along this line was done by Backer(1960). Backer in his attempt to bring micro-economic analysis to fertility used the consumer choice approach. He basically assumed that children are more of 'consumer durable' type of goods, parents ability to

control their reproductive behavior is economic rationality and income and child bearing are not interdependent (Simmon, 1985 : 38). He then tried to give speculative account of the household utility function from 'consumption' of children (including child quality and quantity) and none-child related goods and services and maximized the utility over a constraint of family income which ultimately leads to the demand for children.

Among the basic criticisms of consumer choice approach are: (1) can the definition of consumer durable be applied to children and consequently some of micro-economic propositions about consumer durable fail to hold? (2) The concept of economic rationality especially its application to reproductive behavior was put under debate. The problem of aggregating preferences of different individuals, due to its subjective nature, was under the pipe line of controversy as late as 1977 (Urquidi, 1977). The assumption of independence of income and child bearing, which underlies the standard micro-economic theory of consumer choice, was also invalidated from cross section and time series empirical data (Simmon, 1985;p 39).

Other limitation of Backer's original work is that it dose not deal with the opportunity costs involved in having and raising children. And also it does not consider the demand for children due to expected economic returns from them (Simmon, 1985;38). Hence most of the later developments were constructed by taking into account these limitations.

Schultz (1973) gave the basis for the accountability of time resource through high value of human time. He somehow arrived at a proposition that the ultimate constraint of satisfaction is time-the time needed for consumption. Recognizing children as high time-intensive 'commodities' of the household production activity, he reached at a conclusion that in developed societies where the price of time is high, fertility is restricted due to its time intensive nature where as in developing countries the value of time is low thus the condition is conducive for high fertility. Willis (1973) developed a model that incorporates all but one comments forwarded to Backer (1960); i.e. in the model he expressed his view that children do not make economic contribution to the family (financial or otherwise). Rosenzeweig and Evensen (1977) filled the gap by incorporating the economic contribution of children in market sector (but not in the household activity).

But even then the micro-economic approach remains to be deficient in so many aspects. Among these deficiencies, most micro-economic models are not dynamic, i.e., it basically assumes that parents are planning for their lifetime just after marriage and by the time they got married parents are aware of their wealth and income, costs and prices, etc. that will be experienced in their life time (Simon, 1985). Whenever attempts were made to develop dynamic models they proved to be difficult for empirical testing and ultimately ended as static (eg. the Rosenzeweig and Schultz model as reviewed by Arroyo, 1993). One other deficiency of micro-economic analysis of fertility is that it assumes that the utility of the family is maximized through maximizing the utility of each of household members (Ryder, 1973). In short, this could

mean the relative change of the utility of each of the members of the family per change in the constituents of the utility is the same. But in human behavior and particularly in developing countries, family members' tests and preferences cannot safely be assumed to be the same for all members (see the Comment by Ryder, 1973). Evidences show that females are suppressed than males and children are neglected than adult household members. Thus the use of single utility function and the neglect of decision making process in general and allocating the family's resource (Leibenstein, 1982) in particular in deriving the utilities are inherent problems of most micro-economic models. Along the same line, the plausibility of the assumption of the same 'test' for different socio-economic (or social status groups) is controversial (Leibenstein, 1981).

As to the empirical results, Rosenzeweig and Evensen (1977) found that fertility is positively correlated with landholding, productivity of land, child and male adult wage rates, and negatively associated with males' education above high school, and females educational attainment above primary school. The explanation provided regarding fertility and land holding inequality is that when the distribution of land is highly unequal few will have very large tract of land while the mass will have small plots. For those with small plots the return to a marginal child labour is small but for the wealthy farmer it is very high thus, the majority desire to have fewer children. The rest of the variables considered are: income inequality, adult female wage rate, adult male's primary school completion, adult male's educational attainment just above high school and relative non-proximity to urban areas.

While most of the above findings seem plausible, the finiding that income and fertility are negatively correlated has led to the rise of 'income' effects as distinct from 'price' effect (see Schultz, 1973, Backer, 1973 and others collected in the edited volume containing this citations). The intended implication is that as income grows parents want to have more 'quality' children through better education, health, etc. thus the cost per child rises more than the proportionate rise in income thus resulting in lower number of children demanded. Lebenstine (1974) argued that had it not been for other factors, price effects alone cannot be adequate to off-set and to exceed income effects. The alternative reasoning forwarded is that as income increases a change in test may take place in such a way that parents might prefer non children related goods. This leads to the recognition of children as 'inferior' goods whose 'purchase' relatively declines as income increases. This is quite difficult to imagine as it is but could be convincing thinking in terms of the influence of social group membership (Lebenstine, 1974). Perhaps more important is the change in the value of children that takes place in the course of income rise (or generally development) (Bulatao, 1982).

Among the factors affecting the economic benefits of children to parents, Rosenzeweig and Evenson (1977; 1076) showed that proximity to urban areas influences child labour contribution through higher educational participation, to the extent that the returns to schooling are higher in non-agricultural jobs. Butz and Stan (1982; ;106) also found that in Malaysia older children who lived outside the parental household provide money and labour to their parents and these transfers are higher in rural areas. This study

did not include transfers within household and it also excludes important variables like the education of the receiver and payer of the transfer.

The effect of background variables on the value of children is diversified. For instance, the relationship between the type of women's occupation and fertility suggests that modern occupation is associated with low fertility through its implicit effect on the higher opportunity cost of mothers' time , but when the classification is reduced to labour force participation the relationship disappears (UN, 1985; 23). This suggest that type of occupation works through role compatibility.

In general the above briefly reviewed studies imply that as development takes place (in its wider sense of social and economic transformation) the value of children declines and thus negatively affecting the demand for children. This implies that useful application of the theory should be attempted to explain fertility differentials in the process of socio-economic development. Contrary to this, the low level of socio-economic development in Our country, Ethiopia, poses some doubts on the relevance of micro-economic theory of fertility. However, Schultz (1973) has suggested the potential use of this line of analysis upon appropriate adaptation to the specific case at hand. On the other hand, the socio-economic situation in our country cannot be assumed to be in static equilibrium so long as environmental factors and other economic parameters are believed to be changing. This means the relative prices of certain items change and thus the general equilibrium is liable to change. The implication of this dubious outline

is that there is some possibility of referring micro-economic theory of fertility as explanatory guide to the situation of none stagnant socio-economic under development.

Social-psychological approach is similar to that of micro-economic approach but it differs in that it considers the perception of the values and costs of having children. This approach attempts to use cognitive response of parents on the benefits and costs of children and makes exploratory search on the dimensions, differentials and somehow, the magnitude of the value of children (Rosenstiel, Oppitz and Stengel, 1982). Its relative importance as compared to the micro-economic approach is that it dose not involve any assumption about the nature of the utility function of the subjects of the study. It is highly dependent on explicit responses on similar items of the same phenomena. This approach has special advantages in the context of practical application in countries like Ethiopia where the direct relevance of micro-economic theory of fertility is doubtful. The low value of time, high rate unemployment and underemployment for, low perhaps declining real income, low level of educational attainment of both parents and children coupled with unemployment bottleneck and the prevalence of subsistence economy etc., cast reasonable doubt about the relevance of micro-economic theory of fertility. This leads to the appreciation of the relative advantage of social - psychological approach. In addition to this, the problem of collecting reliable data which is compatible with the theoretical derivations is less pronounced. Moreover, the direct introduction of the issue of costs and benefits of children to parents is believed to give important policy implication than it would be in

the case of micro-economic approach. This then leads to the application of the results for the purposes mentioned above. The problem with social-psychological approach is that it is new (Lebenstine, 1974;p446) and not much empirical studies are to be found .

Among the few direct empirical studies of value of children, Arnold, etal (1975) found that financial costs of children are highly burdensome for rural residents followed by urban lower class and then urban middle class parents and the opportunity cost or restrictions on alternative costs are ranked in the reverse order of residence.

The economic benefits are found to be strong in rural areas followed by urban lower and the least for urban middle class (Arnold etal, 1975). It is also found that economic help is strongly and negatively related with income, education and parity.

Concerning the relationship between fertility behavior and indices of economic value of children the same study indicates a positive relationship between parity and indices of economic value and a negative relationship with family planning variable (knowledge, attitude and use of contraceptive methods). It is also suggested that economic value of children is associated with family planning and family size measures.

Arnold, et al (1975) have also applied multiple regression model to analyze the relationship between socio-demographic variables, value of

children, and fertility behavior. Step wise regression was done on indicators of fertility behavior. First, socio-demographic variables, including economic values of children were regressed, and at the second stage social-psychological variables were included. The result suggests that in general these values have a significant contribution but the magnitude of the increment in the explained variation is not stable across fertility behavior measures. Specifically, ideal family size is among the variables for which economic value of children is found to be strong predictor. The study also revealed that the effect of socio-demographic variables alone explains substantial amount of the variation in fertility behavior.

1.7 The Data

To empirically test the stated hypothesis and to accomplish the objectives outlined, primary data was collected using the sample survey technique. A brief description about the source of the data, the sample design and the method of data collection is given below.

1.7.1 Source of the Data

The data for the study is collected using sample survey in Gonder region. Specifically the survey covered Gonder town, Dabat town of Wegera Awraja and some 10 peasant associations of Wegra Wereda of Wegra Awraja.

The survey questionnaire is prepared in English and translated into Amharic .

1.7.2 The Sample Design

No adequate information was available to give the specific sample design of the study. But the major objective criterion of the sampling design was to assure sufficient sample size. The sample design is supposed to give a representative image of the target population. The target population is defined as couples within active reproductive age and have the experience of having children but are not towards later stage of the family.

The survey design was a two-stage cluster sampling. At the first stage sample areas were drawn from each of the specific areas of the study; namely, Gonder town, Dabat town and the rural area mentioned above. Each of these areas is already subdivided into units called 'Kebeles'. In Gonder town there are 21 Kebeles. In Dabat town there are only 3 Kebeles and in the studied rural area targeted 15 Kebeles (or usually called peasant association, PA's for short).

At the first stage 25% random sample of Kebeles were drawn from Gonder town and the rural area based on probability proportional to size (size being the number of households, believed to be a proxy for the number of

families). At this stage all the 3 Kebeles of Dabat town were included to insure sufficient sample observations from this part of the study area.

At the second stage of the sampling, the subdivisions of Kebeles into 'Zone'(in the case of urban areas) and 'Gote' (in the case of rural area) were used as cluster units of sampling for this stage. From a combination of Kebeles within the specific residential place selected at the first stage of sampling, sample clusters were selected with the probability proportional to number of households with a prior expectation of getting 1300-1400 eligible respondents.

Each of these clusters were surveyed entirely through eligibility criteria and those found to be eligible were interviewed using the main questionnaire. The summary of the sampling procedure is displayed below.

First Stage	Gonder town	Dabat town	Rural area
Total Units = N	21	3	15
Sample Size = n	5	3	6
Sampling fraction = n/N	5/21	3/3	6/15
Second Stage Total Units = M	24	11	19
Sample Size = m	7	4	6
Families Canvased = C	1873	836	1406
Eligible respondents actually interviewed = c	512	212	482

To give some information about the distributional aspects of the survey result mean, standard deviation, minimum and maximum of five variables is presented in appendix 1.

1.8 Methodology

The study will focus on the exploration of the value of children and investigation of the relationship between socio- demographic-economic value of children- fertility behavior. It also attempts to explore the determinants and correlates of the demand for children. Descriptive as well as inferential statistical techniques will be employed. The data will be collected using questionnaire interview method. The main variables of the study, method of analysis and the type and content of the questionnaire are briefly discussed below.

1.8.1 Variables

The study will have three broad group of variables; 1) socio-demographic variables 2) Indicators of economic value of children and 3) Fertility behavior indicators. The content of each of these groups will be as follows:

1. *Socio-demographic variables:-*

   V9 = age in completed years

   V5 = Sex

Edu. = literacy status and highest grade completed in formal school

V1 = Place of residence

Income = Family Income = monthly income or salary (or its equivalent)

2. Economic costs and benefits of children

2.1 Economic benefits of children

2.1.1 Economic benefits of children during child age (in terms of degree of importance)

EBYC1 = Young Child labour in household activity or domestic labour supply

EBYC2 = Transfers from young children in kind

EBYC3 = Transfers from young children in cash

EBAC1 = Labour support/ transfer in kind from adult children

EBAC2 = Transfer from adult children in cash

The above items are measured in a Linkert type scale of 5 points in such a way that 1 is given to the 'Highly important', 2 to 'moderately important', 3 to 'just important', 4 to 'slightly important' and 5 to 'Not important at all'.

2.2.1 Economic cost of children during child age (in terms of degree of burdensome).

PCC1 = Direct economic Cost (i.e. cost of food and health, shelter and clothing, restrict for economic activity)

PCC2 = Indirect economic costs (i.e. restrict from household activity, opportunity foregone in child care, restriction from leisure activity)

These variables are also derived from Linkert type items on perceived economic costs of children through factor analysis.

3. Fertility behavior indicators.

3.1 Actual fertility /parity/:

CEB = Number of children ever born

3.2 Demand for children variables:

DAC = the desire to have additional children or not.

ADC = Number of additional children desired

Socio-economic and demographic variables are both quantitative and qualitative. These variables, because of their objective nature, are measured directly. Indicators of the economic value of children are based on attitudinal scale constructs. A double clarification of attitudinal responses are used. At the first level, responses are classified into 'agree' and 'disagree' dichotomy and, at the second, classification under each of the first classifications comes 'strongly' and 'slightly'. The response 'indifferent' is placed as a middle level response. These responses are factor transformed to form the variables shown above (see chapter 3 for details).

1.8.2 Method of Analysis

The study will use descriptive as well as inferential statistical techniques of analysis. Descriptive statistics will be used to give an overview of the data. Factor analysis is applied to identify the major dimensions of economic benefits and costs of children. This method is appropriate for parsimonious handling of many variables appearing in the same analysis. Analysis of variance is used to explore the presence of significant variation in the dependent variables due to the different independent factors or variables. Multiple classification analysis is used to indicate the direction and measure the magnitude of the effect of independent variables on the value of children.

Finally, regression analysis is used to examine the determinants of the demand for children. Firstly, logistic regression is applied to explore the effect of socio-economic and demographic variables on the dichotomous dependent variable of the desire to have additional children or not. Secondly, ordinary linear regression analysis of socio-economic and demographic variables on the desired number of additional children is applied. The dependent variables are indicators of fertility behavior.

Version 4.0.1 of SPSS/PC+ micro computer program is employed to document and analyze the data.

1.8.3 The Questionnaire and Interview

Structural as well as open ended type of questions were presented. As much as possible questions were presented in a simplified manner so that both the interviewer and the respondent can understand the essence of the question.

Apart from the variables mentioned above some social economic and psychological variables were added to the questionnaire. Specifically, items are included on status indicator items. The elaborated copy of the questionnaire is shown in appendix 2.

The data, as explained earlier, was collected from both sexes of the sample family if both were available for the interview so that gender differential analysis was made possible.

To avoid possible inconvenience of respondents being interviewed by an opposite sex interviewer, female interviewers were recruited to interview female respondents while male interviewers collected the data from male respondents.

Chapter 2 Characteristics of the Study Population

2.1 Age- Sex Distribution

As age is known to be the most important variable in demographic studies, data on age was collected during the survey. The information on age pertains to completed years since Birth. Inspection of the age data is useful before going in to the details.

One of the most common problems of age data is digit preference. In general, people tend to approximate their age towards certain numbers having ending digits which they prefer. One way of looking at the presence of such digit preference is to look into the relative distribution of ages ending from 0 to 9. In the absence of any plausible reason to explain the occurrence of migration (in and out) and mortality with ages ending in certain digits than others or periodic fluctuation in fertility it is expected that each digit will have equal chance of being stated by the respondents. Thus a significant departure of the proportion of population with ages ending in certain age from 10% shows the extent to which that digit is preferred or avoided. Myer's index of digit preference is the average deviation of percent of the blended sum at each digit from 10%. For the survey data Myer's index is found to be 59.5 for males and 56.0 for females.

Based on the 1984 Population and Housing Census data on Gonder region it was found that for the segment of population aged 20-49 Myer's index to be 55.7% for males and 73.1 for females (CSA, 1991; p.33).

This shows that the survey data is relatively of superior quality with respect to digit preference. This leads to the conclusion that the single year age data should be handled carefully.

One, perhaps the most common, way of handling age data problems is simply to work on age grouping. The most conventional type of age grouping is a 5 year age-group such as 0-4, 5-9, ..., 20 - 24, 25 - 29, etc..... Using this conventional age-grouping, Table II.1 shows the age-sex distribution of the study population. In situations in which a relatively fewer proportions are to be classified in some age groups it is usual to include open ended age intervals.

Table 2.1: ***Age-Sex Distribution of the Study Population***

Age Group	*Sex*	
	Male	*Female*
< 25	*1%*	*15%*
25-29	*9%*	*33%*
30-34	*34%*	*41%*
35-39	*22%*	*5%*
40-44	*13%*	*2%*
>44	*20%*	*3%*
N.S.	*2%*	*1%*
Total	*100% (525)*	*100% (N=663)*

Note: *14 Respondents i.e. about 1% did not state their age. For the rest of this paper they are re-distributed on a prorating basis according to the reported age distribution.*

According to Table 2.2 the highest proportion of male respondents are in the age interval 30 - 34, followed by 35 - 39, 40 - 44, 45 - 49, 25 - 29, 45 and above and below 25 in ascending order. On the other hand, 41% of female respondents are aged between 30 - 34, followed by age group 25 - 29 which consists 34% of female respondents. Age group below 25 years

consists 15% of female respondents while the remaining age groups accounted for only 10% of the female. This description indicates that the sample population has sex differential in age distribution. Specifically, male respondents are relatively dispersed over age 30 and above which accounts for 90% while 90% of female respondents are aged below 35 years.

The proportion of female respondent amounts to about 56% while the rest 44% are males. This observation can be further elaborated by looking at the sex distribution by residential area as is shown in Table 2.2.

Table 2.2: ***Distribution of Respondents by Residential Area and Sex***

Residential Area	*Male*		*Female*		*Total*	
Rural	*270*	*55%*	*212*	*45%*	*482*	*40%*
Gonder Town	*196*	*37%*	*334*	*63%*	*512*	*42%*
Dabat Town	*77*	*36%*	*135*	*64%*	*212*	*18%*
Total Urban	*255*	*40%*	*469*	*60%*	*672*	*60%*
Total	*525*	*44%*	*681*	*56%*	*1206*	*100%*

Contrary to the above general statement, in the rural area about 55% of respondents are males and 45% females. The proportion of male respondents in urban areas is below 40%. This shows the presence of sex differential residential pattern in the study population. Although not as high as this one, the result of the 1984 census on Gonder region has indicated the presence of more men in rural areas than urban areas of currently married people (CSA, 1990, P. 44 Table 1.17).

The likely explanation to be given for this differential pattern of residence by sex is that most women were available for the interview than men in urban areas while the contrary was true in rural areas. The reason is that most men in urban area did not stay around the house during the time of the day in which the interview was conducted. In rural areas both men and women were found around the home but due to male dominating influence and females most likely being engaged in household work more of the respondents happened to be males. It was observed that females avoided to respond in the absence of the husband and in few instances males refused to let wives respond to the questionnaire. Even if this was the practical problem, due to the involvement of female interviewers the sex differential in rural areas has been lowered to the level shown in table 2.3.

Considering the urban-rural dichotomy, 40% of the respondents are from rural while the remaining 60% are from urban (both Gonder town and Dabat town). When taken separately, of the total survey population 42% is from Gonder town, 18% from Dabat town and the remaining 40% from rural areas.

2.2 Educational Characteristics

Information on educational characteristics of the study population were collected based on questions about literacy status and the highest grade completed in formal education. Table 2.2.1 presents literacy status of the

study population classified by area of residence and sex. According to this table 57% of the all respondents are Illiterate while the rest 43% are Literate (of which 38% are formally schooled). Sex wise, 58% of males as compared to 56% of females are illiterate. When looked at from residential area point of view a wide discrepancy is observed. In rural area 90% of respondents are illiterate in sharp contrast to only 34% in Gonder town and 38% in Dabat town. This shows that literacy rate is relatively better in Dabat town than rural area and it is better in Gonder town than Dabat town. Again from the same table, more males are in the 'Read and Write only' category in all study areas. Formal school enrollment is found to be high among males in Gonder town while more females than males are found to have attended formal schooling. In rural area no sex differential in formal schooling is observed.

Table 2.2.1: ***Literacy Status of the Study Population by Residential Area and Sex***

Residential Area	Illiterate			Read & Write Only			Formally Schooled		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Rural	235 88%	198 93%	433 90%	24 9%	9 4%	33 7%	9 3%	7 3%	18 3%
Gonder T.	44 23%	127 40%	171 33%	9 5%	3 1%	12 2%	145 72%	184 59%	329 65%
Dabat T.	34 44%	44 33%	78 37%	7 9%	14 10%	21 10%	36 47%	77 57%	113 53%
Total	313 58%	369 56%	682 57%	40 7%	26 4%	66 6%	190 45%	270 41%	458 38%

Similarly table 2.2.2 gives further insight into level of educational attainment in formal education (in completed grades) grouped as 1 - 3 graded, 4 - 6 grade and 7 and above grade completed. About 48% of the

respondents reported to have been enrolled in formal education. School enrolment is high in Dabat town, 85%, and Gonder town, 72%, but it is only 6% in rural area. Concerning sex differential educational attainment, female enrolment ratio is 52% as compared to 43% for males. One important observation could be made about Dabat town. There, both literacy rate and formal educational level are high but the level of highest grade completed is very low. This suggests that among the residents of Dabat town formal education is widespread but it is basically restricted to elementary school attendance.

Table 2.2.2: ***Distribution of Formally enrolled respondents by the Highest Grade Completed, Sex and Residential Area***

Residential Area	1 - 3			4 - 6			7 +		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Rural	2 22%	3 42%	5 31%	5 55%	2 29%	7 38%	2 29%	2 22%	4 25%
Gonder T.	29 20%	36 20%	65 20%	44 30%	44 24%	88 27%	72 50%	104 57%	176 53%
Dabat T.	19 53%	27 35%	46 41%	13 45%	13 17%	26 23%	4 11%	37 48%	41 36%
Total	50 26%	66 24%	116 25%	62 33%	59 22%	121 26%	78 41%	143 53%	221 48%

2.3 Income

Income is one of the most important variables that get the attention of most Economic-Demographic researchers. It is a fairly good proxy indicator of socio-economic status, although its practical measurement is not simple. It is the most relevant item in economic decision making. Sources and expenditure outlay of income form the basis of economic decision making be it to maximize utility or for other objective.

In the present survey which is being reported, the information on income came from the direct question "monthly income/salary of the family" in which the respondent is either a head or spouse of the head of the family.

Table 2.4.1: ***Mean Monthly Income or Salary of the Family in which the Respondent is Member by Sex and Place of Residence***
(In Birr)

Area of Residence	Male		Female		Total	
	Responses	Mean	Responses	Mean	Responses	Mean
Rural	224	101.9	116	152.0	340	119.0
Gonder	196	182.7	304	171.0	500	175.6
Dabat	70	125.6	129	155.9	199	145.2
Total	490	137.6	549	163.4	1039	151.3

In the case of rural area the respondent were asked to estimate the annual crop harvest of the family, livestock sold (if any) and income generated by other means such as working elsewhere for pay. The results of the survey regarding income level are shown in table 2.4.1. It indicates that the response rates are fairly good. For rural it is about 70.5%. The response rates for Gonder and Dabat towns are about 98% and 94% respectively. The main reason for this differential response rate on income could be: in rural areas the means of earning is basically agricultural production which is harvested in one season of the year (spring) and as a result of this some respondents failed to give useful information probably due to memory lapse or even unwillingness to respond to such questions; In urban areas the relatively higher response rate is found in Gonder than in Dabat town. This can possibly be due to the nature and source of income. It is clear that non-salary income either in the form of profit, in the case of petty trade, or activities in the 'informal sector'

is difficult to measure and thus the respondent actually may not be in a position to state the monthly income /salary/ of the family. Still, there are people who have no distinct job like "demobilized soldiers", who used to earn wages but not now. It should also be stated that some people (probably most people) do not want to tell their family income or give a wrong information for various of reasons.

The mean family income per month for the whole sample is found to be 151.3 Birr. For rural areas it is 119.0 Birr while for Gonder and Dabat towns, it is 175.6 Birr and 145.2 Birr respectively. The mean monthly family income reported by females is found to be 163.3 Birr which is higher than that of male respondents by about 25.6 Birr (or about 19%). For Gonder resident males the reported mean monthly family income is about 182.7 Birr which is 79% and 45% above that of rural and Dabat town respondents respectively.

2.4 Fertility Indices

In the study three different measures of fertility are used. These are: (1) children ever born (CEB), (2) the desire for additional children (DAC) and (3) additional number of children desired (ADC). CEB is simply number of children born alive till the moment of data collection while DAC is the desire to have additional children and ADC is the number of children wanted by the respondent to have (If at all he/she desired to bear additional children) in addition to what they already have. These indices will be briefly discussed in the following part of this section.

2.4.1 Children Ever Born (CEB)

Table 2.9.1.1 shows mean CEB of the surveyed population by age, place of residence and sex. From the table we can see that mean CEB is lowest for rural area, marginally high for Dabat town and highest for Gonder town. Since there is a difference in the age structure of the sampled population by residential area, one can attribute part of the observed difference in mean CEB to this fact. The effect of variation in the proportion married, which is one reason for the generally low fertility of urban areas than rural areas, is controlled and this might have contributed to the observed variation. In addition the possibility of relatively high pregnancy wastage in rural areas than urban area might have contributed to the observed differential in CEB.

Table 2.9.1.1: **Mean CEB by Age Group, Sex and Place of Residence**

Place of residence	Male		Female		Total	
	N	CEB	N	CEB	N	CEB
Rural Area	268	4.1	214	4.3	482	4.2
Gonder Town	196	5.5	313	5.4	509	5.5
Dabat Town	77	5.0	135	4.4	212	4.6

To handle this problem and test the presence of differential in mean CEB analysis of covariance was used. The test confirmed that there is a well established differential in fertility among the three residential places ($p = 0.00$).

Similarly, the differential in mean CEB by sex is examined statistically. When the effect of age is not considered the difference is insignificant. But when age is controlled as a covariate the difference becomes high (a difference of 1.1 child) at a significance level of p = 0.000. In addition to this, the effect of covariate (age) and interaction of residential area and sex were examined. The effect of age is found to be strongly significant (p = 0.000) whereas the effect of interaction is found to be insignificant (p = 0.345). Since interaction is found to be insignificant, the result of covariance analysis can effectively be represented in a some what simpler form by multiple classification analysis (MCA henceforth) as shown in table 2.9.1.2.

[1]*Table 2.9.1.2:* ***MCA Result of CEB by Place of Resident and Sex when Age is Controlled***

Grand Mean = 4.815 Variable + category	*N*	*Unadjusted Dev'n Eta*	*Adjusted for Independents + covariates Dev'n*	*Beta*
Area Rural				
Rural	*482*	*-0.61*	*-.40*	
Gonder T.	*509*	*0.66*	*.45*	
Dabat T.	*212*	*-0.20*	*-.16*	
		.22		*0.15*
Sex				
Male	*541*	*-0.05*	*-0.60*	
Female	*662*	*0.04*	*0.49*	
		.02		*.21*
R^2		*0.165*		
R		*0.407*		

Mostly, the desired number of children is considered as an indicator of the demand for children (Lebenstine, 1975, p. 484). Although it is suspected

[1] The proportion of variation explained, R^2, in this table as well as other part of the paper are is low due to several factors. Among this the cross section nature of the data, the simplicity of the models (i.e. additivity assumption in the case of MCA and linearity assumption in the case of the rest of the models) and limitation of explanatory variables are believed to be the principal causes.

due to the possibility of rationalizing the current fertility status, it is expected to indicate the number of children that an individual want to have including those who are born alive. In other words, it is the sum of children born alive and the additional number of children including the would be child (if the wife is pregnant).

The next consideration is about the desire to have additional children. Table 2.9.1.4 shows respondents' desire to have additional children.

Table 2.9.1.4: ***Distribution of Respondents According to their Desire for Additional Children by Sex and Place of Residence***

Place of Residence	Desire for Additional Children											
	Positive				Negative				Not sure			
	Male		Female		Male		Female		Male		Female	
Rural	113	47%	101	51%	43	17%	28	14%	92	37 %	69	35%
Gonder T.	60	32%	73	26%	70	28%	151	54%	56	30 %	55	20%
Dabat T.	27	35%	50	38%	17	22%	20	15%	33	43 %	60	46%
Total	200	39%	224	37%	130	25%	199	33%	181	35 %	184	30%

39% of male respondents want to have additional children, one fourth of them do not want to have children and 35% of them indicated that they are not sure as to whether they need to have additional children or not. For females 37% of them responded positively to have additional children but 33% of them said that they do not want any more children and 30% of them are not able surely to tell their position about having additional children. This indicates that relatively more males want to have additional children (although the difference is only 2 percentage points) than females. More interesting is

the fact that in Gonder town sex differential in proportion who want to have additional children is wide. For males it is only 32% while for females it is 26%. It should also be recalled that when age is controlled males have on the average one child less than females. The differential patterns in the demand for additional children magnified if one considers place of residence as well. 47% of male and 51% of female respondents from rural area want to have additional children. This is in sharp contrast to Gonder respondents where only 32% of males and 26% of females wanted to have additional children. Respondents of Dabat resembled remarkably to Gonder respondents, i.e., 35% of males and 38% females wanted to have additional children.

Concerning those who do not want to have additional children, the highest proportion is observed in Gonder town (28% for male and 54% for female). This is consistent with the observation of the relatively lowest proportion of Gonder respondents who desir to have additional children. For rural respondents, only 17% of men and 14% of women do not want to have additional children. Again, this is consistent with the relatively high proportion of rural respondents report as desiring to have additional children.

Respondents from Dabat exhibited a different behavior. In contrast to the relatively small proportion of those who desire additional children, only a small proportion of them showed no desire to have additional children. A majority of them (above 2/5) are not sure whether they want to have additional children or not. Also, note that a significant proportion of respondents from each residential area are not able to tell their decision

regarding their desire to have additional children. This might be due to two reasons. The first reason is that some respondents may feel ambivalent about the future time as to what the living conditions will be and as a result how difficult or easy to rear children will be is gloomy. The second reason is that the transition from socio-culturally determined high fertility environment to a low - fertility attitude might take some time and this may be a gradual process in which some people are in an intermediate position.

The following general observations could be made. First, males than females are in favor of having additional children. This could be due to gender differential distribution of benefits and costs of having children. Secondly, urban-residence than rural/or even small urban residence influences the desire for additional children negatively. Thirdly, a significant proportion of responses indicate the desire to avoid additional births (more than a quarter). Fourthly, more than a third of the respondents are not sure about their attitude about having additional children. This could be an indication of the uncertainty of the future from the respondents point of view, or the on-set of transition from high fertility attitude to low-fertility attitude. To sum up, there is an indication of the tendency to opt for lower fertility and this tendency is relatively strong in more urbanized area.

2.4.2 Additional Desired Number of Children (ADC)

For those who responded wanting to have additional children, a further question was asked: "How many additional children do you want to have?"

The replies to this question are reported in table 2.9.2.1. The majority of them gave quantitative responses. Specially those who gave numerical responses amounted to 90%. Most of the non quantitative responses are from rural respondents. Here, the problem of quantiffication of such qualitative responses comes. It is not clear as to how many children do actually "Up to God" mean. Similarly, the answer "As much as possible" is also problematic but to a lesser extent. It is difficult to fairly guess as to how large or small the response "Up to God" is.

"As much as Possible" can reasonably be taken as the difference from the maximum number of children a person can have given his socio-biological conditions (including his partner). To make this task further simple, it is assumed that the present respondents will stay with their current spouses thus the "as much as possible" will be mainly the function of socio-biological-demographic condition of the women in question. But this may be quite a wide subject to be dealt with in here. Alternatively, we can estimate the additional number of children wanted by the respondent who wanted additional children as the difference between his/her quoted figure for a number of children in a typical large family in the community he lives and his number of children ever born or expected to be born (for those with wife currently pregnant).

This approach was used to quantify "Up to God" responses in a case study in Nigeria by Farooq (1985). Assuming that people expect much and, not less of every thing including children, we can tentatively use the above

approach to derive quantitative measure of the number of additional children desired (ADC).

Table 2.9.2.1: ***Mean ADC by sex for each of the three residential areas***

Area	Male		Female		Total	
	N	Mean ADC	N	Mean ADC	N	Mean ADC
Rural	113	3.8	101	3.6	214	3.7
Gonder T.	60	3.7	73	4.2	133	3.9
Dabat T.	27	3.3	50	2.7	77	2.9
Total	200	3.7	224	3.6	424	3.6

The above table suggests that the desired number of additional children is high for Gonder town seconded by rural area and the least for Dabat town. It also suggests that in rural area males have indicated slightly higher mean ADC than females. Combining the observations from tables 2.9.1.4 and 2.9.2.1 one can see that in rural area relatively many people want to have children and also their desire is for high number of additional children whereas in Gonder town relatively few people want to have additional children but these few people desire large number of additional children. In Dabat town both the proportion and the number of additional children desired is low. This might indicate that in rural areas where actual fertility is found to be lowest the demand for children is high and similarly in urban areas where fertility is observed to be relatively high the demand for children is low. For a more complete view of fertility differentials further investigation on social, economic and demographic characteristics which are not treated here might be necessary.

Chapter 3 Assessment of the Value of Children

3.1 Towards Specification of the Value of Children

In this study an explicit assessment of perceived economic benefits and costs of children is considered. It is hypothesized that the perceived value of children affects parents' decision making regarding reproductive matters. To this end, data was collected on some indicators of "costs" of and "benefits" from having children as perceived by the respondents. Most of the items considered are pertaining to "economic" matters.

Having said this, economic benefits and costs are measured not through the conventional way of accounting for each of the expenses and transfers involved which would have been the best had it been practically possible. But unfortunately such measurements are very difficult and costly in terms of financial, time and human resources if not impossible. Moreover, the return may not be satisfactory because of the nature of the data that has to be collected to make a feasible assessment of costs and benefits of having children as is being attempted in this study.

The approach used here is to use the parents' perception of costs of and benefits from having children. Several items were constructed to explore these perceptions. To briefly summarize these points Table 3.2.1 is presented below indicating the number of items used to measure the constructs.

Two classes of economic valuations of children by parents are considered: Economic costs and Economic benefits. Economic costs can be divided into direct costs such as cost of food, clothing, medical care etc. which are directly related to expenditure on children, and indirect costs or opportunity costs which relate to the benefits foregone because of children. This second set includes parents' time foregone in baby care and other child-care related matters, leisure of parents' sacrificed because of having children and physical tiresome involved in having and raising children.

Economic benefits from having children, as referred in this study, relates to material, and financial transfers and labour supply from children to the household/family. It is basically assumed that such transfers are in favor of parents although the actual utility is redistributed among the members of the family including children themselves, because it would be their additional cost to make the necessary compensation had it not been made available by children, or else the family in which the parents are responsible should face a lower utility corresponding to the low budget line.

3.2 Reliability of Measures of Costs and Benefits of Children

The first stage in assessing the costs and benefits of children is to inspect the reliability of the measures that are under consideration. To this effect, test of reliability is carried for each of the dimensions of economic value of children. In general, reliability refers to the convergence of concerned

items towards the same measure. That is, it measures the extent to which the several items which are intended to measure the same aspect are interrelated. It measures the correlation between the items under inspection. If all items do measure the same thing, then the correlation between them is expected to be close to 1. If they are not interrelated with each other, then the measure of reliability is expected to be close to 0. A negative relationship is an indication of divergent dimensions being measured.

Table 3.2.1: ***Summary of Items Used to Measure Perceived Economic Costs and Benefits of Children***

Measured dimension	*Number of Items*	*Item Response Categories*	*Reliability Coefficient (α)*
Economic Costs *1. Opportunity Cost*	*3*	*5 = Strongly agree* *3 = Neutral* *1 = Strongly disagree*	*0.8797*
2. Direct Costs	*5*	*5 = Strongly agree* *3 = Neutral* *1 = Strongly disagree*	
Economic Benefits From Young Children *1. Labour/Physical support*	*4*	*1 = Too Important* *3 = Not sure* *5 = Not Important at all*	*0.8699*
2. Transfer in Kind (Material Transfer)	*4*	*1 = Too Important* *3 = Not sure* *5 = Not Important at all*	
3. Transfer in Cash	*4*	*1 = Too Important* *3 = Not Important* *5 = Not Important at all*	
From Adult Of Springs *1. Labour/Physical support*	*4*	*1 = Too Important* *3 = Not Sure* *5 = Not Important at all*	*0.8920*
2. Transfer in Kind	*4*	*1 = Too Important* *3 = Not Sure* *5 = Not Important at all*	
3. Transfer in Cash	*4*	*1 = Too Important* *3 = Not Sure* *5 = Not Important at all*	

A related but different concept is validity of the data. Validity is a measure of how the items are really related to the subject which is being measured. Practical measures of data validity are mostly based on content analysis, i.e., substantiating how well the items are worded, and the information transferred between the respondent and interviewer. Apart from this, empirical validity (Bohrnstedt, 1983:p.73) is given with its upper limit which is equal to the square root of reliability index.

The usually applicable technique of judging reliability is to observe α (alpha); a measure of the average correlation between items. Applying this test to the survey data gave a coefficient of 0.8797 for economic cost items and 0.8699 for economic benefit from young children and 0.8920 for items on economic benefits from adult child. This indicates that the data is fairly reliable. That is, each item under the same dimension agrees with the rest.

Following this, the task is to perform further investigation on the identifiability of different sub-dimensions of costs and benefits of having children. To perform such tasks, a widely used method is factor analysis. Factor analysis is, in brief, a method that helps to uncover the latent variables from the observed responses or variables. It is widely used in spatial analysis as a means of data reduction; in psychological studies to uncover unobservable human behavior and is also used in many other fields. It is a common tool in studying human behaviors which are difficult to observe directly.

The method basically employs a reanalysis of covariance matrix of items based on the assumption that each item is related to some latent phenomenon which is not observed objectively in the data. The essential property of factor analysis is that it attempts to extract the most prominent latent variables in such a way that the number of such latent variables is less or equal to the number of items considered. Several variants of factor analysis have been developed among which principal factor analysis is one. Principal component analysis assumes that each item is a (linear) combination of factors called principal components and error term. Mathematically it is stated:

$$X_{ij} = \sum_j aij\, F_j + e\, ij,$$

where X_{ij} is the response to the $_i$th item, F_j is the $_j$th factor and a_{ij} is coefficient called factor loading that relates $_i$th factor with the X_{ij}'s. Thus factors are revealed through the observed factor structures according to the rule of the highest factor loading coefficient determining the major component of the factor. The name of the factor is intuitively derived from the observed variables for which corresponding factor loadings are highest.

Based on the above brief methodological introduction, it is possible to make use of factor analysis for the following two objectives. Firstly, the results of factor analysis can be used to confirm the reliability of items that are intended to measure the sub-dimensions of economic costs and benefits. The rationale behind is that, if the extracted factors from each of the cost and benefit dimension indicate different regrouping of variables as constituents of factors, then it implies that the items were not valid in measuring what they

are supposed to but instead there is (are) some other dimension(s) which was (were) actually measured. The converse of this, which is also its equivalent, states that if the extracted factors confirm the hypothesized item sub grouping, then the validity of the measurement is established.

The second objective is to make a transformation of the qualitative responses into reduced and quantitative indicators of costs and benefits. This objective can be achieved if the first objective is achieved successfully. Once the factors and the corresponding factor loadings are identified, then it is an easy task to form the factors from the variables and proceed with the new reduced and continuous set of variables.

Application of factor analysis to the data (using varimax rotation) gave the results indicated in table 3.2.2 below. Two important aspects should be noted from this table. The first is that two objectives stated above are achieved successfully. That is, the extracted factors using principal component analysis indicated the validity of the items as can be seen from the confirmatory results of the analysis. For instance, regarding cost variables the first 3 items were intended to indicate opportunity cost dimension which is confirmed by the relatively high factor score coefficients of these variables regarding factor 2 but not factor 1. Thus, opportunity cost can be a plausible name that can be given to factor 2. Factor 1 is characterized by high factor score coefficients for the remaining 5 items thus naming it as direct economic costs will be reasonable.

Table 3.2.2: **Summary Results of Principal Component analysis on Perceived costs and Benefits of Having Children**

Factor Score Coefficient Matrix

A

Sub-Dimension (costs)	Cost Items	Factor 1	Factor 2
Opportunity Cost Variables	V121	0.01462	0.39246
	V122	-0.05575	0.51001
	V123	-0.08134	0.42192
Direct Economic costs	V160	0.21591	-0.00474
	V161	0.23036	-0.02640
	V162	0.26482	-0.04214
	V163	0.26675	-0.03286

B

Sub-Dimension Benefits from Young Children	Benefit Items	Factor 1	Factor 2	Factor 3
Physical/ Labour Support	V169	-0.28555	-0.00531	-0.05611
	V175	0.30904	-0.06337	0.01377
	V181	0.29203	-0.01247	-0.03707
	V187	0.30133	-0.05338	0.01991
Transfer in Kind	V165	-0.03305	0.46130	-0.24815
	V171	-0.02197	0.25623	-0.01882
	V177	-0.02179	0.40385	-0.18565
	V183	-0.00124	0.18003	0.02912
Transfer in Cash	V167	-0.06632	0.08041	0.17783
	V173	0.00092	-0.19452	0.44671
	V179	-0.02282	0.01555	0.24616
	V185	-0.00551	-0.22612	0.46413

C

Sub-Dimension Benefits from Adult offspring	Benefit Items	Factor 1	Factor 2
Physical/Labour Supports and or Transfer in kind	V189	0.72958	0.24198
	V191	0.77034	0.19211
	V195	0.79980	0.06689
	V197	0.79787	0.00465
	V201	0.76161	0.23747
	V203	0.78032	0.22872
	V207	0.81894	0.06952
	V209	0.81609	0.04075
Transfers in Cash	V193	0.11719	0.85132
	V199	0.12341	0.85863
	V205	0.14309	0.87026
	V211	0.13736	0.85586

Another important aspect to note is the ordering of factors. As a methodological consequence the first factor is extracted in such a way that it indicates its relative importance than the second and the second factor indicates its relative importance than the third etc.. From this follows that, direct economic cost is the major component of cost of children as perceived by parents followed by the indirect (opportunity) cost. While this by itself can be a valuable observation, it also calls for further investigation of the correlates and determinants of these factors.

Similarly, the second panel of the above table show that out of the 12 items on perception of benefits from young children 3 factors are extracted. The first factor is characterized by having higher factor score coefficients for 4 variables which are all related to the perceived physical support from children. The second factor, likewise, is related to the 4 items on material support perceived by parents, and the third factor is related to perceived financial transfers from children. This, again, confirms that the three dimensions are apparent in relation to the types of benefits from young children. In addition to this, the result suggests that physical/labour support is the major economic benefit expected from children followed by transfers in kind and the least is expected financial transfer from children. Following this analytical result, the three economic benefits from young children are named as labour/physical support, transfer in kind and transfer in cash.

The same analysis on the perceived benefits from adult children is also presented in the third panel of the above table. The items involved for this

sub-dimension are very much alike with the sub-dimension on expected benefits from young children except for the change in mentioning about grown-up adult children who have managed to support themselves and no more full members of the family.

The result of factor analysis, unlike the case of expected benefits from young children, gave two factors. The first factor relates to items on physical/labour support from children and material transfers (Transfer in kind) and the second factor items on financial transfers. It should also be noted that labour/physical support is the major components of benefits from adult children and it is seconded by financial transfer.

The second objective, which is more of a consequence to the first is the reduction of the data. The transformation follows a simple arithmetics of applying the relevant factor score coefficients on the corresponding item responses.

3.3 Determinants and Correlates of Costs and Benefits of Children

Most conventional theoretical discussions on costs of and benefits from having children generally state that as development proceeds cost of children increases while benefits from children decline. Some give specific historical accounts of events or processes which are said to have effect on either cost of or benefits from children or both. Among such frequently mentioned factors, development is the prominent one although its definition has proved

difficult to be universally applicable. However, there are some common elements which are associated with it. Short listed, if possible, are educational attainment or literacy, industrialization or urbanization, the rise in absolute as well as relative income of the nation and/or the citizens, social organization or social differentiation which relates to the level and degree of social division of labour a correlate of labour specialization etc..

Perhaps it is better to attempt to clarify and specify certain workable variables that can practically lead to the systematic exploration of the costs and benefits of children.

Among the usual indicators of development, specially, human resource development, education is the major element. Although there seems to be consensus about its role as development indicator, it does not insure universality of its effect (and causes). The objective, content, duration and method of education can not be assumed to be the same throughout the world. And thus, at least, to this extent its application as an index of (human resource) development can be questioned. However, there are certain minimum basis in which it can serve as a means of identifying one group of people from another, assuming all other things remaining constant. It is in this regard that it is used unconservatively. Otherwise, the comparative basis of education has to be developed well before it can serve as an explanatory variable.

In literatures related to economic analysis of fertility, education is seen as having at least two effects. One is income effect which assumes that those who have higher educational level are most likely earning higher income (on permanent basis) thus for such people child benefit (apart from the pleasure derived from emotional benefits) is low while on the cost side it is high since they want to raise their children in a relatively good condition (better education, health care, clothing nutrition etc.). Thus, the net effect is a relatively high cost as the number of children increases. The other effect of education is an indirect one or mostly referred to as opportunity cost of children. The hypothesized effect is that as compared to less educated, more educated will incur more opportunity cost from having children as a result of high wages attached to the time of such parents relative to their less educated counterparts. Similarly, this same phenomenon is also expressed inter-temporally.

Another variable that is supposed to correlate with the economic costs of and benefits from children is the presence of 'urban atmosphere'. Urbanization is frequently seen as an important correlate of socio-economic development. Although, as discussed with education, it has a problem of conceptualization, many observable features can be outlined to make use of urban-rural or major urban, small/medium urban classifications. In general, socio-economic services like education, health and public administration; economic services like electricity, water, telephone, and sewerage/sanitation systems, transportation & market location are the major aspects that are closely related to the degree of urbanization.

Gender issue can also be the potential source of variation about the valuation of children. It is of interest to test whether gender differentials are present regarding the economic costs and benefits from children. It is clear that the sex differential roles in bearing and rearing of children are existent in almost any society. It seems that much of child related burdens are of great concern for women than men while the economic benefits are at best equally shared among parents or fathers get more of it. This study will attempt to see how such economic costs and benefits are evaluated by each gender.

In addition to the above three variables which are hypothesized as sources of variation in the perceived economic valuation of children three important demographic variables will be considered. The first is age. Age is a central variable that corresponds to the life cycle of any population. Reproductive behavior is both biologically and socially linked with age. Birth, puberty, menopause and death are few examples that are by and large determined by age. Marriage, social and economic status are also, among other things, functions of age. Thus we will consider age as a possible source of variation in the people's valuation of children. The second demographic variable considered is fertility as measured by children ever born. The expectation is that those who have already given to more births will have a different valuation for children than those who have given birth to few children.

A family with many children will have higher economic costs for a given level of expenditure on child than a family with fewer children. By the same

token, a family with many children but of an average living standard, can benefit more than the family with fever children. This is a direct proposition. On the other hand, it is also legitimate to say that child costs and benefits are related to the "quality" of children, thus the question of child quality along with quantity should be considered to make the analysis more complete. A family with fewer number of children but with higher quality children can have both higher costs as well as get more benefits than a family with many children but low quality. In the present study only quantity of children is considered as a correlate of costs and benefits of children.

3.4 Analytical Results

To assess the variability in the costs and benefits of children, analysis of variance is employed on each cost measures and three of benefit measures.

3.4.1 Perceived Direct Costs of Children (PCC1)

First, PCC1, the direct economic costs is examined. Table 3.4.1.1 gives ANOVA of perceived direct economic costs (PCC1). From this table variation in the score of PCC1 is significant between place of residence, sex and education. Both 2 and 3 order interaction of these factors are also found to be significant sources of variation in PCC1 (at p = 0.024 and 0.043 levels respectively). Among the covariates only age is found to be a source of variation in the dependent variable at a very high significance level (p = 0.001).

To further explore the variation in PCC1, table 3.4.1.2 presents results of MCA of PCC1 by the above explanatory variables. It shows that in the major urban area, Gonder town, PCC1 score is high while statistically no variation is present between Dabat town and the rural area, when the effects of all interactions and covariates are controlled. Males are found to have PCC1, higher than females and this difference is not affected by interaction of other factors and covariates with sex. This result also suggests that education is not linearly related with PCC1 although its explanatory power is fairly large (beta = 0.11). Direct economic costs are high for illiterates, for those who completed grades 1-3, and 7 and above in formal education while it is low for those who completed 4 - 6 grades of schooling. It should also be observed that place of residence has more explanatory power (adjusted ß = 0.21) while sex and education have lower explanatory power (adjusted ß = 0.11).

3.4.2 Perceived indirect (opportunity) Costs of Children (PCC2)

***PCC2** (Perceived Opportunity Costs), unlike PCC1, the result of ANOVA on PCC2 shown in panel B of table 3.4.1.1, suggests that there is no strong statistical variation attributable to education or any of the interaction terms. Also, the same is true in the case of CEB while the effect of age is found to be the only explanatory variable which has a significant influence (p = 0.031). Place of residence has accounted for the variation in PCC2 significantly (p = 0.022) but sex is less significant (p = 0.307). From the MCA result corresponding to the ANOVA on PCC2 it is clear that PCC2 is*

again high in urban Gonder while it is relatively very low in Dabat town but marginally low in Rural areas. The effect of sex and education are not described because of their insignificance in explaining the variation in PCC2.

Table 3.4.1.1: ANOVA of PCC1 and PCC2 With respect to place of residence (V1), Sex (V5) and Education (Edu) where Age (V9) and CEB are treated as Covariates

		PCC1				PCC2			
Source Of Variation	Degrees Of Freedom	Sum Of Square	Mean Square	F Ratio	P value	Sum Of Square	Mean Square	F Ratio	P value
Covariates	2	12.273	6.137	5.813	0.003	5.160	2.580	2.508	0.082
V9	1	11.157	11.157	10.568	0.001	4.792	4.792	4.658	0.031
CEB	1	0.054	0.054	0.051	0.822	0.054	0.054	0.052	0.819
Main Effects	7	39.717	5.674	5.374	0.000	10.534	1.505	1.463	0.177
V1	2	24.440	12.220	11.575	0.000	7.890	3.945	3.834	0.022
V5	1	6.800	6.800	6.441	0.011	1.074	1.074	1.044	0.307
Edu	4	9.551	2.388	2.262	0.061	0.581	0.145	0.141	0.967
2- Way Interactions	14	28.052	2.004	1.898	0.024	12.251	0.875	0.850	0.614
V1XV5	2	4.846	2.423	2.295	0.101	1.224	0.612	0.595	0.552
V1XEdu	8	19.944	2.493	2.361	0.016	5.247	0.656	0.637	0.747
V5X Edu	4	6.172	1.543	1.461	0.212	5.514	1.379	1.340	0.253
3-Way Interaction Explained	6	13.817	2.303	2.181	0.043	2.873	0.479	0.465	0.834
Residual	29	93.859	3.237	3.066	0.000	30.818	1.063	1.033	0.419
	728	768.573	1.056			749.05	1.029		

Table 3.4.1.2: ***MCA of PCC1 & PCC2 with respect to V1, V5 and Edu where CEB and V9 are considered as covariates.***

Grand Mean PCC1 = -0.062 PCC2 = -0.240 Variable + Category	N	PCC1 Unadjusted		PCC1 Adjusted for Interactions & Covariates		PCC2 Unadjusted		PCC2 Adjusted for Interactions & Covariates	
		Dev'n	eta	Dev'n	beta	Dev'n	eta	Dev'n	beta
V1: 1 = Rural	238	-0.15		-0.21		-0.05		-0.05	
2 = Gonder T.	338	0.22		0.25		0.12		0.12	
3 = Dabat T.	173	-0.22	0.18	-0.20	0.21	-0.19	0.12	-0.18	.011
V5: 1 = Male	364	0.13		0.13		0.01		-0.05	
2 = Female	412	-0.11	0.11	-0.11	0.11	-0.01	0.01	0.04	0.05
Edu: 0 = Illiterate	387	-0.05		0.06		-0.02		0.02	
1 = Read & Write	43	-0.15		-0.04		-0.13		-0.05	
2 = 1-3 Grade	83	0.17		0.06		0.09		0.04	
3 = 4-6 Grade	82	-0.16		-0.33		0.05		-0.01	
4 = 7 + Grade	163	0.15	0.11	0.01	0.11	0.01	0.05	-0.04	0.03
Multiple R^2					0.060			0.020	
Multiple R					0.240			0.142	

3.4.3 Expected Benefits from Children

The same analysis is done to explore the expected benefits of children with respect to the above three variables. The variables that represent expected benefits of young children are expected labour/physical support from young children (EBYC1), expected material transfer from children (EBYC2) and expected financial transfer from children (EBYC3). These three variables will be examined in their respective order as follows:

3.4.3.1 Expected Labour/Physical Support from Young Children (EBYC1)

The result of ANOVA displayed in table 3.4.2.1.1 panel A indicates that, in general, the three main factors considered explain the variability in EBYC1 significantly (as implied by p = 0.000 for the jointly explained variation).

The effect of age is found to be statistically significant at 0.045 level. The other covariate CEB is found to be insignificant. The joint effect of the main effects of V1, V5 and education is found to be highly significant (p = 0.000). But among these main effects v5 is found to be insignificant (p = 0.403). Education is found to be significant at 0.18 level whereas place of residence is highly significant at zero level.

Among the three two-way interactions, the sex-education and the place-of-residence-education combinations are insignificant (p = 0.928 and 0.605 respectively) while the remaining interaction term is found to be highly significant (p = 0.000). The three-way interaction is also insignificant.

From the above analysis, it is interesting to note how the dependant variable is related with the effects which are found to be significant in the ANOVA. Again, refer to the MCA analysis in table 3.4.2.1.2 corresponding to the ANOVA described above. The result suggest that expected benefits from child labour is lowest (highest in absolute magnitude of the score) in Gonder town and highest in rural area while in Dabat it is close to rural area. Concerning education, it is observed that when the effect of covariates and interactions is controlled, it is high (lowest in absolute magnitude) for the illiterates, those with 1-3 grade and 4-6 Grade while it is low for the rest two categories of education, namely, read and write only and 7+ Grade completed.

Table 3.4.2.1.1: **ANOVA of EBYC1 and EBYC2 With respect to place of residence (V1), Sex (V5) and Education (Edu) where Age (V9) and CEB are treated as Covariates.**

Source Of Variation	Degrees Of Freedom	EBYC1 Sum Of Square	EBYC1 Mean Square	EBYC1 F Ratio	EBYC1 P value	EBYC2 Sum Of Square	EBYC2 Mean Square	EBYC2 F Ratio	EBYC2 P value
Covariates	2	4.294	2.147	2.027	0.132	1.073	0.537	0.510	0.600
V9	1	4.0271	4.271	4.033	0.045	1.015	1.015	0.965	0.326
CEB	1	0.797	0.797	0.752	0.386	0.351	0.351	0.334	0.564
Main Effects	7	74.333	10.619	10.026	0.000	63.866	9.124	8.676	0.000
V1	2	31.870	15.890	15.003	0.000	34.912	17.456	16.600	0.000
V5	1	0.741	0.741	0.699	0.403	4.115	4.115	3.913	0.048
Edu	4	6.658	1.665	1.572	0.180	9.163	2.291	2.178	0.070
2- Way Interactions	14	33.160	2.369	2.236	0.006	50.405	3.600	3.424	0.000
V1XV5	2	18.158	9.079	8.572	0.000	26.149	13.075	12.433	0.000
V1XEdu	8	6.757	0.845	0.797	0.605	13.286	1.661	1.579	0.127
V5XEdu	4	0.923	0.231	0.218	0.928	14.681	3.670	3.490	0.008
3-Way Interaction	6	5.092	0.849	0.801	0.569	8.107	1.351	1.285	0.262
Explained	29	116.880	4.030	3.801	0.000	123.45	4.257	4.048	0.000
Residual	728	771.034	1.059			765.56	1.052		

Table 3.4.2.1.2: **MCA of EBYC1 & EBYC2 with respect to V1, V5 and Edu where CEB and V9 are considered as covariates.**

Grand Mean EBYC1 = 0.056 EBYC2 = 0.053 Variable + Category	N	EBYC1 Unadjusted		EBYC1 Adjusted for Interactions & Covariates		EBYC2 Unadjusted		EBYC2 Adjusted for Interactions & Covariates	
		Dev'n	eta	Dev'n	beta	Dev'n	eta	Dev'n	beta
V1: 1 = Rural	238	-0.29		-0.28		0.23		0.26	
2 = Gonder T.	338	0.30		0.30		-0.28		-0.31	
3 = Dabat T.	173	-0.14	0.26	-0.16	0.25	0.21	0.23	0.22	0.25
V5: 1 = Male	364	-0.05		0.04		-0.01		-0.10	
2 = Female	412	0.05	0.05	-0.04	0.04	0.01	0.01	0.08	0.08
Edu: 0 = Illiterate	387	-0.20		-0.07		0.11		0.00	
1 = Read & Write	43	-0.07		0.11		0.42		0.25	
2 = 1-3 Grade	83	0.03		-0.03		-0.24		-0.19	
3 = 4-6 Grade	82	0.11		-0.04		-0.30		-0.14	
4 = 7 + Grade	163	0.41	0.22	0.18	0.10	-0.10	0.17	0.11	0.10
Multiple R^2					0.089			0.073	
Multiple R					0.298			0.270	

3.4.3.2 Expected Material Transfer from Young Children (EBYC2)

In panel B of table 3.4.2.1.1, the results of ANOVA of EBYC2 are given while panel B of table 3.4.2.1.2 gives the corresponding MCA. Again, the same set of explanatory variables and covariates are retained.

Accordingly, it is found that explanatory variables and covariates jointly contribute significantly to the variation in EBYC2. Further, looking into the broad sources of variation one can see that only main effects and their two way interactions are statistically significant ($p = 0.000$ for both of these groups). Of the three main effects, sex is found to be significant at 0.048 level while education is significant at 0.070. Variability in EBYC2 between the three places of residence is highly significant ($p = 0.000$).

Among the two-way interaction terms, interaction between place of residence and education is found to be marginally significant ($p = 0.127$) while the rest two are highly significant ($p < 0.009$).

Following the above observation, comparisons on mean scores of EBYC2 will be discussed for the three main effects and all interaction terms which are found to be significant. The MCA table corresponding to the ANOVA on EBYC2 is used to explain the main effects while the effect of interaction terms is treated using a cross-classification table of mean EBYC2 scores as shown in table 3.4.2.2.1.

Again here, as it was the case with EBYC1, in Gonder expected benefit from young children is lowest while it is highest for rural area, and Dabat being very close to it (a difference of 0.04 in mean EBYC2 score). The difference in mean EBYC2 score between sexes is not much in magnitude. Males expect more benefit, in the sense of EBYC2, than females. The adjusted difference in mean scores indicates that those with 1 - 6 Grade of education expected benefits is high but for the remaining levels of education it is low. The highest expectation is for those with 1 - 3 Grade of education while the lowest is for those who can only read and write.

Table 3.4.2.2.1: Cross Classification of Mean Scores of EBYC2 by Sex, Place of residence by Education and Sex by Education

Raw Factor		Sex		Education				
Column	Factor	Male	Female	Illiterate	R.W Only	1-3	4-6	7+
Place of residence	Rural	0.10 (150)	0.48 (133)	0.27 (244)	0.42 (25)	-0.61 (4)	0.16 (6)	1.05 (4)
	Gonder T	-0.01 (147)	-0.38 (191)	-0.14 (85)	1.19 (4)	-0.44 (52)	-.35 (64)	-.17 (133)
	Dabat T	0.05 (49)	0.39 (88)	0.17 (58)	0.35 (14)	0.36 (27)	0.10 (12)	0.42 (26)
Sex	Male			0.07 (177)	0.55 (27)	0.12 (40)	-0.23 (44)	-0.13 (58)
	Female			0.24 (210)	0.33 (16)	-0.48 (43)	-0.27 (38)	-0.01 (105)

The interaction between place of residence and sex and education are presented in table 3.4.2.2.1 above. This table shows the mean EBYC2 scores for each cell specified by each possible combination of categories of the interacting factors. Accordingly, the first two columns in the body of the table together with the first 3 rows form the interaction space of sex and place of residence. The remaining 5 columns stand for the five categories of

education while the last two rows represent the two categories of sex to be crossed with the education categories. In each cell, the first line indicates the mean score while the next line gives the number of observations that gave the corresponding mean score.

Describing the first interaction term in short, the magnitude of the mean score increases as one goes from Gonder to Dabat to rural but as one moves from male to female the magnitude of the differential between residential places becomes higher indicating the presence of interaction between sex and place of residence. In such a case, valid comparison between the categories of one variable should be made at each levels of the other variable. Thus the result obtained from gender differential mean score for rural is 0.38 for Gonder it is 0.37 and for Dabat it is 0.34.

The corresponding explanation for the interaction effect of education and place of residence is very much similar. But since the number of observations in some cells are very few the discussion will be limited to cells with more than 20 observations. For Gonder residents the mean score generally grows negative (with the exception of illiterates) as educational level increases and the same is true in the case of Dabat town but the successive differences as well as the absolute levels of the scores are not the same for the two residential places. Similarly, the interaction between sex and education suggests that the mean scores decline fast for females than males as educational level increases.

3.4.3.3 Expected financial Transfer from young children (EBYC3)

As was done for the two cost related and two benefit related variables, the search for a statistically significant variability on EBYC3 will be attempted here. In the same manner, table 3.4.2.3.1 and table 3.4.2.3.2 depict the results of ANOVA and MCA on EBYC3 where V1, V5, and Edu are the main factors that are under search and V9 and CEB are treated as covariates to handle their effect from being mixed with the main effects. It should also be mentioned that all possible combinations of interaction are also considered as source of variability in the EBYC3.

From the table, we see that in general the considered sources of variations (effects) represent a statistically significant differential in EBYC3 (at p = 0.000). Among the covariates, the previously discussed variables, age (V9) appeared as significant sources of variation at a very high level (p = 0.000). This suggests that V9 explains the variation in EBYC3 score significantly or more specifically, variation in V9 is associated with variation in EBYC3 score. The effect of CEB is found to be insignificant.

Among the three main effects considered, V1 and Edu are found to be significant sources of variation (at p = 0.000 and 0.035 respectively). Among the three possible interactions, only the term involving V1 and Edu is found significant at P = 0.065 level. The three factor interaction is not significant at all. To see the levels and variability of EBYC3 by these sources which are found to be significant corresponding results of MCA are described below.

The adjusted deviations (for interaction and covariates) show that EBYC3 is high in Gonder while it is lowest in Dabat town and intermediate in rural area. It must be remembered that low EBYC3 corresponds with higher expectation of financial transfer from children. Thus, the expected financial benefit is high in Gonder and lowest in Dabat town and intermediate in the rural area. Although sex is found to be insignificant source of variation, it is suggested that slightly males' expectation is higher than females'. The effect of education (when adjusted in the sense indicated above) is that at lower levels it is high and as education increases to 1 - 3 Grade it reaches the minimum and gradually rises to the last educational category. Thus the importance of financial benefit from children diminishes as education progresses from illiteracy to the primary elementary level (1 - 3) and afterwards it rises gradually.

Table 3.4.2.3.1: ***ANOVA of EBYC3 With respect to place of residence (V1), Sex (V5) and Education (Edu) where Age (V9) and CEB are treated as Covariates.***

Source Of Variation	Degrees Of Freedom	Sum Of Square	Mean Square	F Ratio	P value
Covariates	2	3.823	1.912	1.673	0.188
V9	1	3.793	3.793	3.320	0.069
CEB	1	0.299	0.299	0.262	0.609
Main Effects	7	93.235	13.319	11.658	0.000
V1	2	79.415	39.707	34.754	0.000
V5	1	0.333	0.333	0.291	0.590
Edu	4	11.906	2.976	2.605	0.035
2- Way Interactions	14	23.019	1.644	1.439	0.129
V1XV5	2	1.946	0.973	0.852	0.427
V1XEdu	8	16.912	2.114	1.850	0.065
V5X Edu	4	6.793	1.698	1.486	0.204
3-Way Interaction	6	5.898	0.983	0.860	0.524
Explained	29	125.97 5	4.344	3.802	0.000
Residual	728	831.77 1	1.143		

Table 3.4..3.2: ***MCA of EBYC3 with respect to V1, V5 and Edu where CEB and V9 are considered as covariates.***

Grand Mean EBYC3 = 0.073 Variable + Category	N	Unadjusted		Adjusted for Interactions & Covariates	
		Dev'n	eta	Dev'n	beta
V1: 1 = Rural	238	0.07		0.19	
2 = Gonder T.	338	-0.30		-0.38	
3 = Dabat T.	173	0.61	0.29	0.56	0.33
V5: 1 = Male	364	-0.05		-0.03	
2 = Female	412	0.04	0.04	0.02	0.02
Edu: 0 = Illiterate	387	0.00		-0.12	
1 = Read & Write	43	0.20		-0.04	
2 = 1-3 Grade	83	0.27		0.33	
3 = 4-6 Grade	82	-0.17		0.02	
4 = 7 + Grade	163	-0.09	0.11	0.11	0.13
Multiple R^2					0.101
Multiple R					0.318

3.4.4 Expected Benefit from Adult Children

One aspect of the value of children is as a means of support for parents at the later stage of their life. This is what is called old age security. An adult child is socially or culturally expected to support his parents and close relatives. This expectation is not likely to be the same as the expected benefit from young children on the premiss that young children are usually members of the family. They are part of the family sharing the common resources, the process of human capital formation or investment in children is in process and moreover the day-to-day decision regarding them is also the direct concern of the family. From the result of factor analysis it is showed that unlike the expected benefits from young children it has two dimensions: a combination of expected labour support and material transfer from adult children (EBAC1)

and, expected financial transfer from adult children (EBAC2). Accordingly, children are means of old age security. The expected benefit from adult children is analyzed in the sections to come.

3.4.4.1 Expected labour Support and Material Transfer from Adult Children (EBAC1)

The results of ANOVA presented in table 3.4.3.1.1 indicate that of the two covariates, V9 and CEB, only V9 is found to be significant source of variation in EBAC2 at 0.048 level of significance. Out of the three main effects under consideration, i.e., v1, v5 and Edu, v5 appeared insignificant (p = 0.736) while V1 is marginally significant at 0.288 level and Edu is highly significant (p = 0.000).

The corresponding MCA analysis shown in table 3.4.3.1.2 revels, apart from what is said above, that expected labour support and transfer in kind is, when the effect of interaction is not adjusted, highest for Gonder and about the same level for the other two residential places. When the effect of interactions is removed such expected benefits become highest for rural area followed by Gonder town and the least for Dabat town. The unadjusted differential of mean EBCA1 score indicates that females' expectation is slightly higher than males' while the adjusted differential tells the opposite. The unadjusted effect of education indicates that the expected benefit is lowest for the illiterate category followed by the 1-3 grade, 'Read & Write Only', 7+ grade categories and the highest for 4-6 grade category. The adjusted deviation showed a monotonous fall in mean score up to the 4-6

category and a rise at 7+ grade level. This suggests that the expected benefit rises as educational attainment increases upto the completion of elementary school and then sharply falls for those with above elementary school achievement.

3.4.4.2 Expected Financial Transfer from Adult Children (EBAC1)

Similarly description of the results of ANOVA and MCA on expected financial transfer from adult children is considered here. Table 3.4.3.2.1 and table 3.4.3.2.2 show ANOVA and MCA results respectively. Unlike the rest of the cases, CEB but not V9 appeared significant correlate of EBAC1. All the main effects and the two-way interaction terms involving the variable education are found to be significant sources of variation. The three-way interaction is also found to be insignificant.

The MCA result indicates that expected financial transfer from adult children is highest for Gonder town followed by rural area and the least for Dabat town. Similarly, males than females indicated higher expectation of such benefit. These two variable exhibited no remarkable difference due to adjustment for the effects of covariates and independents. The unadjusted effect of education reveals that expectation of such benefit increases monotonously upto the 4-6 grade category and rises moderately. The adjusted effect of education follows almost the pattern except that the 'Read and Write Only' showed a fall in mean score from 0.076 to -0.234. This also results in a non-monotones pattern to be observed. In addition to this, the

adjusted deviation for the 7+ grade category showed a remarkable rise from the unadjusted level of -0.12 to 0.20. In general, the analysis suggests that the expected financial transfer from adult children is relatively higher for those who have some education below grade 7.

As a generalization, the analysis suggests that of the two types of expected benefits from adult children a systematic differential is observed with EBAC2. It indicates that such benefits are expected by the residents of Gonder town than the other two places of residences. Males are also found to have higher expectation of financial remittance from adult children than females. Also such expectation is highest for those with little education than those with above elementary grade education or those who are illiterate.

The implication of the above generalization is that old-age security or assistance from grown up children is expected in different forms. Of these, financial transfer was indicated to be dependent on place of residence, education and, to a little extent, with sex. The possible explanation for the poor fit of the model could be due to the unpredictability of such expectation based on the considered explanatory variable. That there might be a mix of a balanced attitude about the expected non-financial assistance from children irrespective of residential place, education or sex. Financial assistance is sought as important for the major urban residents.

Table 3.4.2.1.1: ANOVA of EBAC1 and EBAC2 With respect to place of residence (V1), Sex (V5) and Education (Edu) where Age (V9) and CEB are treated as Covariates.

		EBAC1				EBAC2			
Source Of Variation	Degrees Of Freedom	Sum Of Square	Mean Square	F Ratio	P value	Sum Of Square	Mean Square	F Ratio	P value
Covariates	2	3.994	1.997	1.961	0.141	10.780	5.390	5.226	0.006
V9	1	3.994	3.994	3.994	0.048	0.169	0.169	0.164	0.685
CEB	1	0.565	0.565	0.565	0.456	8.2561	8.256	8.005	0.005
Main Effects	7	32.358	4.623	4.540	0.000	166.491	23.784	23.060	0.000
V1	2	2.537	1.263	1.248	0.288	138.437	69.219	67.110	0.000
V5	1	0.116	0.116	0.114	0.736	4.044	4.044	3.921	0.048
Edu	4	26.582	6.645	6.526	0.000	15.264	3.816	3.700	0.005
2- Way Interactions	14	18.283	1.306	1.283	0.212	34.494	2.464	2.389	0.003
V1XV5	2	2.997	1.499	1.472	0.230	2.238	1.119	1.085	0.338
V1XEdu	8	11.533	1.442	1.416	0.186	22.697	2.837	2.751	0.005
V5XEdu	4	2.827	0.707	0.707	0.596	17.809	4.452	4.317	0.002
3-Way Interaction	7	9.092	1.299	1.276	0.259	8.520	1.271	1.180	0.312
Explained	30	63.728	2.124	2.086	0.001	220.285	7.343	7.119	0.000
Residual	837	852.266	1.018			863.583	1.031		

Table 3.4.2.1.2: MCA of EBAC1 & EBAC2 with respect to V1, V5 and Edu where CEB and V9 are considered as covariates.

		EBAC1		EBAC2					
Grand Mean EBYC1 = 0.197 EBYC2 = 0.046 Variable + Category	N	Unadjusted		Adjusted for Interactions & Covariates		Unadjusted		Adjusted for Interactions & Covariates	
		Dev'n	eta	Dev'n	beta	Dev'n	eta	Dev'n	beta
V1:1 = Rural	310	0.05		-0.05		0.22		0.27	
2 = Gonder T.	369	-0.07		-0.01		-0.47		-0.52	
3 = Dabat T.	189	0.06	0.06	0.10	0.06	0.56	0.38	0.59	0.42
V5: 1 = Male	411	0.01		-0.01		-0.05		-0.09	
2 = Female	457	-0.01	0.01	0.01	0.01	0.05	0.04	0.08	0.07
Edu: 0 = Illiterate	438	0.13		0.16		0.15		0.01	
1 = Read & Write	50	-0.09		-0.09		0.03		-0.28	
2 = 1-3 Grade	100	0.03		-0.04		-0.05		-0.04	
3 = 4-6 Grade	96	-0.44		-0.47		-0.43		-0.23	
4 = 7 + Grade	184	-0.08	0.18	-0.08	0.19	-0.12	0.17	0.20	0.12
Multiple R^2					0.040			0.164	
Multiple R					0.199			0.404	

CHAPTER 4 Demand for Children

4.1 Determinants of Demand for Additional Children

In a micro economic framework for the analysis of fertility behavior, demand for children is a central variable around which the decision making process revolves. Not only micro-economic approach to fertility analysis but also socio-demographic approaches emphasize the importance of studying the determinants of the demand for children. Demand for children can be affected by socio-economic, and cultural factors. More importantly the value of children in general and economic value of children in particular affect the demand for children. If people feel that they are not better-off because of having children, then their demand for children will accordingly be low and similarly if people feel that they will be better-off from having children, then they are likely to have higher demand for children and develop the desire towards it. This is the underlying suggestion of demographic transition theory in view of the value of children (Lebenstine, 1974, p. 459).

In the present study demand for children is measured as (1) the binary variable of the need to have additional children or not and (2) if the response to (1) is yes then how many additional number of children are desired. It would have been better if the demand for children could be measured independent of the fertility experience so that the unconditional demand for children would be studied through ideal family size. But such attempt failed

because of the difficulty, in part of both the respondents and the interviewers, of the reconstruction of one's own life experience had it been to be practiced in the present context. During the field study this problem was noted and also it was expected from the very conception of including the variable.

As a result of this the alternative taken is to use the desire for additional children as an indicator of the demand for children. It is expected that among others, the desire for additional children could be a function of sex, place of residence, age, education, income and the fertility experience.

Gender differential in the desire for children can arise from the differential in the costs and benefits from children given the socio-economic settings. As it is mostly argued by gender issue advocates, mothers are the ones who get most of the trouble of child bearing and rearing activities during the early ages of children, while fathers are, if not at all, less affected at this stage. After children are grown up, they will be less demanding in terms of child care and will become an aid to the family by contributing, in one or another form, to the family. This implies that at the very early stage of having and rearing children mothers' share of the cost in terms of physical and mental (emotional) burden is higher. At the later stage it is probably the sex of the child and socio-economic status of the family that matters as to which one of the parents might benefit in relative terms. If the child is female and the socio-economic status of the family is low then the mother might benefit from her daughters home-work activities while the father might not gain directly. On the contrary, if the child is male, there is little chance that the mother

might get support from the son as it would be in the case of a daughter. The father might get some assistance from his son in his work if the type of work permits substitution of son to his own work. There are a lot of possibilities in which child support can be gained by either of the parents irrespective of the gender of the child but in the context of the study area it seems that most of the work division is likely based on gender. Thus, it is expected that direct gain of benefits from sons is relatively more for the father and that of daughters is relatively more for the mother. There, the expected sign of the relationship, in the case of low socio-economic groups, is likely to depend on the cost of child bearing and rearing. Then, it is expected that males than females might desire to have children. In the case of higher socio-economic groups the situation regarding child birth and rearing costs is the same as that of lower socio-economic groups. In the case of benefits from child support it is reasonable to expect that there will not be any gender differential because child labour is not vital in relieving parents from their work burden. Then, even in this case the important factor that affects the gender specific desire to have additional children is the early child bearing and rearing cost, which is believed to be higher for mothers than fathers. The above outline is made by assuming that emotional benefits from having children is equal for both sexes while some micro-economists (Schultz, 1973) argued that emotional benefit derived from children is a function of time allocated to enjoy it. Thus, mothers than fathers might have higher child utility. This view is not supported here because in the context of the study population the price of time is not as such high to prohibit fathers from enjoying the cheer of their children. Probably it is the cheerful moment of the day of child that the father

will be at home and thus the benefit is likely to be equal among the two parents. Therefore, it is expected that women will have lower desire to have additional children than males.

Place of Residence

In the descriptive part of this paper it is indicated that place of residence makes a noticeable difference in almost all aspects of factual variables. Moreover, degree of urbanization is closely related with social and economic conditions. Thus, it is expected that these differences will have a combined bearing on the peoples' desire to have additional children. Specifically, in rural area where child labour is most likely useful, both in the farm and home activities, the expected reward from child labour is likely to be higher than elsewhere. At the same time, child schooling is not common and thus direct and opportunity cost of schooling is low.

In addition to this child care is relatively less time- intensive in rural than urban areas due to formal and informal education about child care services. Therefore it is reasonable to expect higher proportion of rural parents to desire to have additional children than in the urban areas.

Age

Age is one possible factor that can affect child bearing experience in a variety of ways. The direct implication is through its correlation with fertility

experience (which is positive) and education (which is negative since the younger generation than the older generation is more exposed to education) social and economic status such as house ownership, income. Moreover, the life-time experience of different cohorts may not be the same. The older generation might have been enjoying less hardship in rearing and educating children than the younger generation now finds itself. Generally, the condition seems that nominal income has been stagnating (or even declining in the case of rural area due to unprecedented crop failure and loss of productivity of level and stagnant urban economy of the study area) while inflation growing recurrently thus resulting in decline in real income level. Therefore, the young generation might find it difficult to withstand this situation together with having additional children. As a result, one may expect that the odds ratio of desire to have additional children is low for younger people than the older people. At the same time, those who are aged may have had enough number of children and thus may not want additional children. Therefore one can expect a low odds ratio of the desire for children at the younger and older ages while higher for the in- between ages.

Education

In the study area the level of educational attainment is found to be at its lowest level. The overwhelming majority is illiterate and only very small proportion of the respondents are reported to have attained grade level 7 or more. Thus the effect of elementary education and literacy are most relevant to this study.

Primary education is believed to create conducive environment for "modernization" which induces as divergent view and practices than the usual tradition. Specifically regarding fertility those with some primary education are expected to opt for lower family size, better education and health for children and better housing condition due to their exposure to such things. At the same time such people are expected to have a relatively better access to birth control methods and thus can think of the possibility of limiting reproductive behavior by choice while those with no education may not be aware of the possibility of birth control methods, and perhaps may tend to rationalize the likely reproductive outcome of uncontrolled reproductive behavior. This leads to the expectation that education will have a negative effect on the desire to have additional children.

Income

The literature on the direction of the relationship between fertility and income suggests the presence of both positive and negative effects. The negative relationship is more or less through the role incompatibility of rearing children and income earning activity. It assumes that these roles are incompatible. On the contrary, if the role incompatibility assumption cannot be justified, as in the case of employment in the "informal sector" or none labour income earning possibility then there is a possibility of either no relationship or a positive relationship. Thus it is expected that a positive relationship is expected between income and the odds ratio of the desire to have additional children over not to have additional children, based on the

premise that the major source of income in the study area is not formal sector employment.

CEB

The number of children ever born might be of great importance in influencing the demand for additional children. The literature suggest that the utility of the child declines as the birth order increase although the "economic benefits" of child labour and old age security motives are higher. But even if the latter assumptions are withdrawn, the utility of the marginal child is expected to decline after certain number of children because of the decline in the expected return from a marginal child birth. Thus in general the higher the CEB the lower the demand for additional children.

In the context of the study population the expected return from children is basically in the form of labour/material transfer and financial transfer (to a lesser extent) thus the return to labour in the household activity will be limited by the family resources like the size of land, the working "own capital" (if any) and the size and type of household activity. It is, therefore, fair to expect that on the average those who already have higher children will have low desire for additional children

4.2 The Model

To analyze the effect of the variables discussed above on the desire for additional children a logistic regression model is used. It basically relates the odds of the favorable category with the unfavorable category as dependent variable while the categorical independent variables' coefficients are expressed as the deviation from the base category (in this study the last category of the respective categorical variable).

Mathematically it can be expressed as :

$$ln\{p/(1-p)\} = a_o + a_i X_i + b_i Y_i + ei$$

Where p is the probability of desiring for additional children, a_i's are the regression coefficients of categorical variables X_i indicating the change in the odds ratio, p/i-p, if the independent variable is in the i_{th} category than the reference category (the last category) and bi's are the linear regression coefficients of continuous variables. The e_i term is the error term representing all other variables not included in the model.

The estimation of the constants involves maximizing the likelihood function

$$L(P) = -2 \Sigma ln \hat{P}_i (\hat{p}_i / p_i)$$

using the Newton- Rampson iterative algorithm. The test statistic for the fit of the whole mode is likelihood chi-square ratio. The individual coefficient can

also be assessed for its significance by observing the level of significance implied by the Wald test statistics (Judge, Hill et al, 1982; p 105 - 106).

4.3 Results and Discussion

All the variables discussed were analyzed using the method presented above as independent variables, only income was transformed using a natural logarithmic transformation. Two dependent variables are considered: the desire for additional children and the number of additional children desired. Logistic regression model is applied to analyze the first dependent variable while ordinary dummy variable regression model is applied to examine the relationship among the dependent variable and the set of independent variables. The results of logistic regression are show below in table 4.3.1.

Additional children is 2.56 times higher for rural area and it is only 0.67 times for Gonder town as compared to that of Dabat town, i.e., there is 2.56 times odds for additional children in rural area than the residents of Dabat while it is only .67 times in the case of Gonder town. This means that as compared to Dabat town the desire for additional children is more in rural area and it is less in Gonder town.

Similarly males are found to have a bit higher odds ratio than females (1.077 times). But this effect is statistically insignificant (p 0.48). As a whole the effect of age is found to be significant (p = 0.041). Statistically significant difference in the odds ratio from the base category is observed only among the second, the fourth and

Table 4.3.1: ***Logistic Regression fit for the Desire for Additional Children on V1, V5, V9, Edu, CEB and Ln(income)***

Variables	*B*	*Wald*	*D.f*	*Sign*	*Exp(ß)*[2]
V1(area)		*25.566*	*2*	*0.000*	
V1(1 = Rural)	*0.9396*	*25.519*	*1*	*0.000*	*2.559*
V1(2 = Gonder)	*-0.0741*	*7.214*	*1*	*0.007*	*0.667*
V5(Sex)					
V5(Male)	*0.0741*	*0.492*	*1*	*0.483*	*1.0769*
V9(Age Group)		*11.590*	*5*	*0.041*	
V9(1 = <25)	*0.0633*	*0.0573*	*1*	*0.811*	*1.065*
V9(2 = 25-29)	*0.3695*	*3.894*	*1*	*0.048*	*1.447*
V9(3 = 30-34)	*-0.1659*	*1.241*	*1*	*0.265*	*0.848*
V9(4 = 35-39)	*0.3884*	*3.907*	*1*	*0.048*	*1.475*
V9(5 = 40-44)	*-0.5094*	*3.001*	*1*	*0.483*	*0.601*
Edu		*21.534*	*4*	*0.000*	
Edu(1 = Illiterate)	*0.7718*	*10.122*	*1*	*0.002*	*2.164*
Edu(2 = R&W only)	*-0.3315*	*2.288*	*1*	*0.1304*	*0.718*
Edu(3 = 1-3 Grade)	*0.0174*	*0.003*	*1*	*0.954*	*1.018*
Edu (4 = 4-6 Grade)	*-0.3598*	*1.507*	*1*	*0.2195*	*0.698*
CEB	*-0.1768*	*19.166*	*1*	*0.000*	*0.838*
Lnic (Ln(income))	*0.0625*	*0.568*	*1*	*0.451*	*1.0645*
Constant	*0.0597*	*0.0175*	*1*	*0.895*	
Model Chi-Square		*D.f*		*S.g*	
100.045		*15*		*0.000*	

fifth categories of age. Specifically, the relative odds ratio is 1.447 and 1.475 for the second and the forth age groups respectively. For the first age group it is 0.601. The rest two age groups have been found to have no significant effect. This suggest that the effect of age is not linear.

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[2] Exp (ß) is the ratio of the odds of a given category in relation to the reference category. Odds ratio is the ratio of respondents favoring an event to those not favoring it.

Education is found to be a highly significant factor in making variation in the desire to have additional children or not. The overall significance level of Wald statistics (which is equal to 21.534) for education is zero. As compared to the last category of education (grade 7 or above), it shows that 'illiterate' have higher chance of opting for additional children. That is the chance of wanting for additional children among 'illiterates' is 2.164 times that of those completed grade 7 or more. The relative odds ratio of desiring for additional children for the "read and write only" category is only 0.718. Meaning, the odds of desiring to have children for those who can "read and write" is 0.718 times that of those who have completed grade 7 or above. However the statistical significance of multiplicative factor of this odds ratio is marginal (p = 0.1304). For the educational category '1-3 grade' completed it is close to one and also it is highly insignificant (p = 0.954). Those who have attained grade 4 - 6 have a lower relative odds ratio factor (0.698) but its significance level is again marginal (p = 0.219). To generalize, the desire for additional children, as compared to those who have completed grade 7 or more, more illiterates desire to have additional children. For those who have completed 1 - 3 grade the chances are equally likely while those who have no formal education but are able to read and write only, and those attained educational level 4 - 6 grade the chances are lower.

As expected the effect of life time fertility on the desire for additional children is negative. For every child ever born the odds declines by 0.8324 and it is strongly significant (p = 0.000).

4.4 The Demand for Additional Children

Up on analyzing and discussing the determinants of the desire or not for additional children it is necessary to throw some light on the correlates and determinants of the number of additional children parents desire to have.

As before, the correlates of dependent variable addition number od children desired (ADC hence forth), are, place of residence, sex, age, education, income and the realized fertility i.e. CEB. To see the significance of these correlates in making variation on ADC analysis of variance is considered first. Then to observe the magnitude and direction of the differences in ADC at the different levels of the independent variables (or source of variations) the MCA results are presented. Due to the problem of missing cases of income data it is not considered in this part of the analysis, while CEB, is treated as a covariate whose effect should be removed first to make safer conclusion about the remaining effects.

After the presentation of ANOVA and MCA results, regression analysis is followed so that it is possible to see the nature of interrelationship between the dependent variable, ADC, and the independent variables. At this stage income enters into the analysis. The problem of missing data on income is treated by substituting the mean income level of the non-missing observation for those cases with missing income record.

4.5 Determinants and Correlates of ADC

To examine the presence of significant variation in ADC across the different levels of place of residences sex, age and education the result of analysis of variance is presented in table 4.5.1 below.

Table 4.5.1: **Analysis of Variance of ADC on V1, V5, V9 and Edu While CEB is Treated as a Covariate**

Source of Variation	D.F	Sum of Squares	Mean Square	F	Sig Level
Covariates	1	0.255	0.255	0.663	0.802
CEB	1	0.255	0.255	0.663	0.802
Main Effects	12	157.723	13.144	3.252	0.000
V1	3	59873	29.94	7.407	0.001
V5	1	14.983	14.983	3.707	0.055
V9	5	71.985	14.397	3.562	0.004
Edu	4	31.869	7.967	1.971	0.098
Explained	13	157.978	12.152	3.007	0.000
Residual	410	1657.001	4.041		
Total	423	1814.929	4.291		
Covariate Raw Regression					
CEB	-0.021				

From the above table, CEB is found to be insignificant ($p = 0.802$) but it is indicated at the bottom that the sign of the relationship is negative. This means that among those who reported desiring to have additional children there is no significant difference in the number of children they would like to have as a result of the difference in realized fertility. This might be due to the similarity in CEB of these groups as was discussed in chapter 2.

All the main effects are significant. Place of residence and age are highly significant ($p < 0.005$), sex and education are also significant but relatively at a moderate level ($p = 0.055$ for sex and $p = 0.098$ for education).

To examine the pattern and the nature of the relationship between ADC and the main effects the results of MCA are displayed below in table 4.5.2. The table indicates that place of residence makes a noticeable difference. When the effect of all other variables considered in the analysis is removed, the observed deviations in mean ADC by place of residence widens and the proportion of variation explained by this factor is large (beta = 22%).

Particularly when the effect of other factors are not controlled, Dabat residents, on the average, want 0.63 less number of additional children than the overall average, while for rural residents the corresponding figure is 0.28 children in excess of the overall average. The residents of Gonder are only marginally below the overall average by 0.08 children. This means when the effect of other variables are not considered Dabat residents have indicated on average ADC of 3.127 which is lower than that of rural residents by 0.91, and that of Gonder residents by 0.55. When the effects of other variables are controlled the means ADC becomes 2.947, 3.597 and 4.147 children for Dabat town, Gonder town and rural area respectively.

Table 4.5.2: **MCA of ADC with Respect to V1, V5, V9 and Edu while CEB is Considered as Covariate**

Grand Mean = 3.757 Variable + Category	N	Unadjusted Dev'n	eta	Adjusted for Independents + Covariates Dev'n	Beta
Vi = 1 = Rural	214	0.28		0.39	
2 = Gonder T.	133	-0.08		-0.16	
3 + Dabat T.	77	-0.63	0.16	-0.81	0.22
V5 + 1 = Male	200	-0.10		-0.23	
2 = Female	214	0.11	0.05	0.25	0.12
V9 = 1 = < 25	408	-0.09		-0.35	
2 = 25 - 29	123	0.03		-0.08	
3 = 30 - 34	138	0.08		0.08	
4 = 25 - 39	66	0.39		0.75	
5 = 40 - 44	18	-0.87		-0.88	
6 = 45+	31	-0.69	0.15	-0.55	0.19
Edu 0 = Illiterate	244	0.02		-0.12	
1 = R & W Only	25	0.56		0.34	
2 = 1 - 3 Grade	33	-0.15		0.14	
3 = 4 - 6 Grade	43	0.52		0.77	
4 = 7 + Grade	79	-0.47		-0.23	
			0.14		0.14
Multiple R squared	0.084				
Multiple R	0.289				

Variation in mean ADC by sex is also apparent. When the effect of other variables is not adjusted it appears that male have lower ADC than females by 0.21 child. After adjusting for the effect of other variables the difference grew to 0.48 child in the same direction. The explanatory power of sex increases from its level of 6% when no adjustment is made, to 12% after adjustment for covariates and interactions.

The effect of age on ADC, as indicated in the table, is non- linear. Both the adjusted and the unadjusted deviations indicate this fact.

The table indicates that mean ADC is highest for the age group 35 - 39 and low for the age groups below 25, 40 - 44 and 45 and above. Since the number of observation in the age group 40 - 44 is only 18, it is safe not to stress on its result. The young age groups have found to have less mean ADC. And also, the old age groups have lower ADC. The maximum mean ADC, before adjusting for the effects of covariates and independents, is 4.147 while after such adjustments it is 4.507. The difference between this age group and the first age group, below 25 years, is 0.48 in the case of unadjusted deviations and 1.10 in the case of adjusted deviations. The deviation of mean ADC between the age group 35 - 39, where mean ADC is found to be maximum and, above 44 years age group is highest (1.07 in the case of unadjusted deviation and 1.30 in the case of adjusted deviation). The explained variation in ADC in the case of unadjusted deviations is 17% and in the case of adjusted deviations it is 21%.

The above description of analytical results indicates that both the young and the old generation want less number of additional children. Those from old age groups might already have enough number of children (although the covariate analysis gave no significance linear relationship between ADC and CEB but it can be significant to the older age groups) or else it can be due to their awareness of rearing of realizing high numbers of additional children. The case of younger age groups desiring less number of additional children is more interesting. It may indicate that there is a change in the attitudes towards low than high fertility. Possibly, the younger generation might have constraints in achieving or maintaining its social status (Lebenstine, 1974) and

even might feel future conditions to be less conducive to child rearing. Specifically, these young people are ejected to have small children and might not be benefiting from child labour instead laboring relatively much on children and thus facing the higher child costs (disutility).

The effect of education on mean ADC is found to be non linear. The unadjusted deviations indicate that mean ADC is lowest for those who have completed grade 7 or above followed by those who completed 1 - 3 grades and then followed by the illiterates. The highest is observed for those in the "Read and Write only" category seconded by those who completed 4 - 6 grade. However, when the effects of other variables are adjusted the magnitude of this deviation is changed.

Since there are only 25 cases in the "read and write only" category we may omit it. Thus, the result indicates that mean ADC rises from 3.636 children for the 'illiterate' category to 3.897 in the 1 - 3 grade category and reaches its maximum at 4.517 for the 4 - 6 grade category. The educational category 7 and above grade has the lowest mean ADC of 3.527.

While the low mean ADC of the "Illiterates" is difficult to explain the finding that above elementary school attendance indicating lower ADC is in accordance with the general expectation, i.e., it indicates the negative effect of education on fertility attitudes after elementary school.

4.6 Regression analysis of ADC

To examine the effect of income on ADC, regression analysis is used. The independent variables are: place of residence, sex, age, education CEB and income. The first four variables are coded into dummy variables in such a way that belonging to a category of variable is given code 1 and 0 for not belonging. Except the last category all are represented as dummy variables thus by convention the last category is omitted. As a result there are only two dummy variables representing place of residence which actually has three categories. The same is true for the remaining categorical independent variables and thus all in all there are $\Sigma(n_i-1)$ *dummy variables, where* n_i *stands for the number of categories of the ith variable. Since there are 3 categories of place of residence, two categories of sex, 6 categories of age and 5 categories of education there are 12 dummy variables and two continuous variables in the regression equation.*

To improve the fit of the model logarithmic transformation the dependent variable for income is found useful. The results of regression analysis are displayed in table 4.6.1. The purpose of this analysis is to show the effect of income on ADC, which was not possible in the previous section because of the prevalence of cases with missing observation on income (35.6%). To handle this problem mean income level was substituted for those missing cases and found to be adequate as compared to the regression results on cases excluding missing cases.

Table 4.6.1 **Results of Multiple Regression Analysis of ln(ADC) on V1, V9, Edu, CEB and Lninc (ln (income))**

	B	T	Sign. Level
Continuous variables ln(income)			
CEB	-0.07967	-2.660	0.0081
	0.001501	0.068	0.9460
Categorical variables (Dummy Coded)			
Vi = 1 = Rural	0.35524	5.110	0.000
2 = Gonder	0.00392	0.695	0.487
V5 = 1 = Male	-0.121769	-1.910	0.057
V9 = 1 = < 25	- 0.00927	-0.069	0.946
2 = 25 - 29	0.042637	0.370	0.711
3 = 30 - 34	0.066001	0.617	0.53
4 = 35 - 39	0.25669	2.264	0.024
5 = 40 -44	-0.16416	-1.081	0.280
Edu 1 = Illiterate	-0.03721	-0.437	0.6635
2 = Read & write only	0.06730	0.501	0.617
3 = 1 - 3 Grade	0.11420	1.051	0.294
4 = 1 - 4 Grade	0.18874	1.908	0.057
Intercept	1.3508	6.427	0.000
F		4.051	0.000

$R = 0.3490$
$R^2 = 0.1218$
$R^2 = 0.0917$

The result indicates that income has a strong negative effect on ADC. Since both ADC and income are log transformed, the resulting regression coefficient is elasticity of ADC with respect to income, which measures the percentage change in ADC for percentage change in income. Accordingly, for a 10 per cent rise in income their is about 0.8% decline in ADC.

One possible explanation for this negative effect of income on the number of additional children desired is that for families with higher income the cost of children is relatively high while the benefit from children is lower. Probably higher income earners want to achieve other higher non-child related

social status position and thus want less number of additional children. It can also be due to lower possibility of substitution of child labour to income which may operate in a negative way while at a lower level of income child labour might be needed to augment the income of the family. Since the dependent variable is additional number of children desired it is likely that parents feel the immediate cost of having child during the early stage of child development while non-economic benefits might have induced to demand additional children.

CHAPTER 5 Summary And Conclusion

5.I. SUMMARY

In search of policy relevant explanation for the observed levels of fertility, the value of children and the change in it across time and space has continued to be the primary underlying contention.

This has been expressed in many macro-and micro level studies. Among the many theoretical and observational generalizations embodied in demographic transition, value of children is one of the major underlying elements (Bulatao, 1982). In connection with the prevalence of high fertility in sub Saharan Africa, the high value of children is frequently cited as an ultimate explanation.

Such understanding of the role of value of children has necessitated research towards the investigation of its dimensions correlates and determinants. Several discipline have been contributing for the better understanding of the value of children and its connection with fertility behavior. Among these micro-economic approach and social-psychological approaches have gained remarkable attention. Micro-economic approach largely lends it self to the adaptation of consumer-behavior theory to fertility behavior. It assumes utility maximization as a central goal that leads to the specific fertility outcome along with the changes in developments which have beginnings on micro-economic variables. It has been the tradition in this

school to imply a change in one or another form of the value of children due to the development which leads to a change in fertility behavior. The major shortcoming of such approach is the questionability of the adoption of consumer-behavior to the humanly behavior of fertility. It has been useful analytical framework for studying the development-fertility relationship.

While micro-economic approach is concerned about the outcomes of the change in the value of children on fertility, social psychological approach gives emphasis to the perceived changes in value of children and tries to link such evidence with fertility behavior. It is characterized by the explicit concern to the perception of parents about the costs and benefits involved in having children. For this reason researchers have attempted to revile the various dimensions of the value of children and among such various dimensions the economic values are both theoretically as well as empirically proved to be identifiable. Especially economic value of children is strongly believed to be the prime component of value of children to people in developing/under developed area. To this effect this study has been concerned with the economic value of children.

This study presented empirical findings on the perceived economic value of children and the demand for additional children, In the first chapter the theoretical justification and background of the study was dealt with. It also gave the outline of the data source and the design of the study. The second chapter was concerned with the description of some of characteristics of the study population. Descriptive discussion on the composition of the study

population was made regarding age-sex structure, residential area, education, incomes, educational and fertility characteristics. It was found that the age reporting is to some extent, affected by digit preference. And suggestion was made to work on a 5-year age grouping as an easy-way correcting mechanism. It was shown that there was a sex and place of residential bias in coverage which is more of a fact type phenomenon and some how affected by the design of the survey. For instance the sex differential were mainly due to the nature of gender differential response rates while the differential in place of residence distribution is largely due to the design of the survey which aimed at making spacial comparative analysis possible.

The level of educational attainment indicated the prevalence of illiteracy in rural area and a relatively higher proportion of Gonder residents attending formal education at almost all hierarchies of education while in Dabat it was found that lower level of formal school achievement is relatively high. The data on income was found problematic due to (1) the conceptual difficulty of defining monthly income of the family and (2) high-non-response rates. The conceptual problem of monthly income largely arises form the non-monthly nature of some earned in-comes line in the case of rural-agricultural production and trade activity in general and peaty trade in particular. Another problem is the discontinuity of income due to several reasons as a result of which the non-response or missing data was encountered. However, after making reasonable adjustment to the annual agricultural crop harvest and livestock sales attempt was made to arrive at a unified measure of income. The result showed the presence of income differentials by sex and place of residence.

Particularly females have found to report higher monthly family income. And Gonder town respondents found on the average to belong with relatively higher monthly income followed by Dabat town residents and the least for rural residents. Since there was some reason to suspect the information regarding land holding no serious attention is given to it.

The fertility behavior was considered at some detail. Children ever born, the desire to have additional children and the number of additional children desired are the main indicators of fertility behavior used in the study. It was found that the level of children ever born adequate to be relied up on. The average children ever born is 4.82. Noticeable differentials are also explored among which the high level of men children ever born for Gonder town resident and the lower level for rural area respondents is major. Also, females have been found to have higher children ever born that males. The desire to have additional children was used as an indicator of demand for children. The finding incited that of the total only 37% wanted to have additional children while 33% of responses indicated not to want to have additional children and the remaining one-third indicated their inconclusive position. Females are found to have slightly negative/non-positive inclination to having additional children than males. At an aggregate level, sex differential in the desire to have additional children seems minor but desegregation of the information indicates some major differentials. For instance higher proportion females residing in Gonder town indicated a negative response than males. But for the rest of residential places sex differentials are not pronounced. This is largely due to the higher mean

children ever born of females than males. In any case it indicates that the demand for additional children is low in Gonder that the rest of residential places studied.

Concerning the number of additional children desired the study reviled that rural residents indicated higher size followed by Gonder town residents and the least by residents of Dabat town. It is also indicated that females than males have higher number of additional children desired. It is also important to note the finding that those who indicated their desire to have additional children have a lower actual fertility. Combining the actual fertility with the additional desired number of children it is found that on the average people want to have about 7.7 children which is very close to the existing national estimate of total fertility rate.

The analysis on economic value of children the perception of parents revealed two dimensions of costs, three dimensions of benefits from young children and two dimensions of benefits from adult children. Factor analysis confirmed these costs and benefit dimensions as follows. The costs of children are the direct economic costs and the indirect or opportunity costs of children. Of these the first dimensions appeared more strong. On the benefit side of young children, labour/physical support, transfers in the form of kind and transfers in the form of cash are successfully identified. Regarding the benefits from adult children two dimensions extracted. The first factor happened to be labour support/transfer in cash and the second, transfer in cash.

The study has indicated that the effect of income on demand for children to be negative. It also reviled that the demand for children is relatively higher for those with some education than those with no education or those with education above elementary school. In addition, rural residents have found to have relatively higher demand than urban residents. Although those who want to have additional children are found to have relatively lower number of children, the number of additional children desired is found independent of the number of additional children desired.

In connection of the economic value of children and the demand for children the following points can be said. Firstly, costs of children specifically financial costs (or direct costs) appeared to be education and those with above elementary education. Secondly physical/labour support is found to be more important by those who live in rural area, females and those with no formal education while material transfer from young children perceived to be important for those living in Gonder town, males and have some formal education (elementary education). Financial transfer from young adults is given more importance by Gonder residents, males and those with no formal education and the illiterates. Benefits from adults children, which normally corresponds to old age security, is found to be more important to Gonder residents, males and those with some elementary education. Roughly for segments of study population for whom economic costs are recognized as high the benefits are lower and the demand for children found to be higher. This indicates the importance of the value of children in shaping the fertility behavior.

5.2. Policy Implications

In conclusion this study has demonstrated the importance of social-psychological approach to study the dimensions, correlated and some determinants of value of children. The study has some preliminary policy relevance. Of such the main ones are; (1) policies might be designed to lower fertility through affecting the costs of children, or the benefits from children. Although the rises in the direct cost of children seem to be against the welfare, promotion of education of children and creating employment for parents, specially for women, will have some desirable negative influence on fertility (or demand for children). To reduce the importance of child labour supply measures should also be taken. Labour specialization which need trained labour and with enhanced productivity of labour such as improved farm technology and home technology might be relevant with this regard. Such measures reduce the demand for child labour and also raise the cost of children because of the induced higher human capital due to the human skill required to cop-up with the demand for specialized labour. Promotion of productive skill giving education might be the specific recommendation along this line. This might have a negative implication on the high value attached to child labour contribution in rural area. Such measures should not only limited to the out-door activities but also include household activities. The finding also indicates that the effect of primary education is to raise the perceived value of children thus accordingly effort should be made to reverse such attitude by revising the content of education being given at this level since primary education by it self is a desirable and achievable goal of development.

The finding that above elementary school attainment has a negative effect on demand for children indicates the need to promote such education. Such target might be resource effective if it is geared towards promotion of women participation in above elementary schooling.

While these are the some broad policy implication the study has also some implications on measures to be taken to achieve lower fertility and also promote the welfare of the society. The most important finding is the significant proportion of people in reproductive age have indicated their desire to avoid having additional children. This implies provision of effective family planning services to avoid unwanted births should be the immediate action to be taken. Particularly the target of such service should concentrate on major urban centers like Gonder town while giving due attention to other residential places in the medium to long term objectives.

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Appendix 1. *Mean standard deviation minimum, maximum and Number of cases for selected variables.*

Variable		Mean	Standard Deviation	Minimum	Maximum	Number of cases
Children ever born (CEB)	1.Rural	4.205	1.98	1	9	482
	2.Gonder T.	5.475	2.07	1	11	512
	3.Dabat T.	4.615	2.31	1	10	212
	4.Total	4.815	2.11	1	11	1206
Income	1.Rural	119.0	54.38	38	437	340
	2.Gonder T.	175.6	102.47	40	1450	500
	3.Dabat T.	145.2	86.05	42	680	199
	4.Total	151.3	91.05	40	1450	1039
Age	1.Rural	29.6	7.8	18	54	458
	2.Gonder T.	34.2	10.4	21	62	519
	3.Dabat T.	31.6	11.2	19	56	210
	4.Total	32.7	9.98	18	62	1187
Age at first Marriage	Males					
	1.Rural	21.2	5.2	16	26	241
	2.Gonder T.	26.4	8.4	17	28	172
	3.Dabat T.	24.6	6.8	15	28	68
	4.Total	24.3	7.5	15	28	481
	Females					
	1.Rural	16.2	4.8	13	21	117
	2.Gonder T.	18.4	6.7	15	25	315
	3.Dabat T.	17.3	6.2	14	24	121
	4.Total	17.2	6.1	13	25	553
Number of times Married	1.Rural	1.32	.62	1	4	471
	2.Gonder T.	1.44	.46	1	5	523
	3.Dabat T.	1.61	.66	1	4	212
	4.Total	1.42	.51	1	5	1206

Appendix 2

Addis Ababa University

Institute of Development Research

Demographic Training And Research Center

The Questionnaire of the study

Part 1 Screening for Eligibility

This is to collect information for the study on the value of children. The information that you are kindly asked to give is very essential to the study but it will not be used in any harmful to the society or to you. Thus you are kindly requested to cooperate by giving few information about you and your family.

E1. Are you currently married? **Eligible if**

Yes /____/ No /___/ Currently married

E2. Is your spouse living with you now?

Yes /___/ No /___/ Living with spouse

E3. How many children do you have? At least one child

_____ Children.

E4.How old are you and your spouse?

(Age in completed years)

Wife_____ Years Wife is aged 20-34

Husband_____Years

Identification

Area Rural= 1, Gonder= 2, Dabat= 3

Higher/Wereda _____

Kebele/PA _____

Cluster/Gote(code) _____

House No. _____

Name of Household head _____

Main questionnaire

[For eligible respondents only]

This study is aimed at investigating the factors that influence the reproductive behavior of people. It is Known that having children is beneficial to the country, the local community, the family and the parents. It is also known that bearing and rearing children entails material, emotional and financial costs.

Now I am going to ask you some questions about these and other related things concerning you and your family. Again I kindly request you to give me accurate information as much as you can.

Respondent's Name _____sex 1.Wife 2.Husband

A Fertility Indicators

1. Current fertility and family size

F1. How many children have you ever born? ---------

F1.1 How many of them are sons? _____

F1.2 How Many of them are Daughters? _____

2. Desired fertility

F2 Is your wife/Are you pregnant now?

1 /___/ Yes 2/____/ No 3. /___/Uncertain.

(Go to F6) (Go to F6)

F5 Do you think you want any more children, after the one you are having?

1 /__/ Yes 2/____/ No 3 /___/ Uncertain

(Go to F10)

F6 If you could have just what you want how many more children would you like to have?

F6.1 _____ more children or _____ to _____ more children

F6.2 As many as possible /____/

F6.3 Upto good /____/

F6.4 It depends/__/(Ask) on what does it depend

_____

_

F7. You have told me that now you have _____ children of your own and you would like to have _____ more children (_____to _____)more children. So you want a total of _____ children (_____ to _____) children of your own. Is this right?

(If not repeat Items F1 upto F6).

F8. Now I want to ask about some specific reasons why you want another child. For each one, please tell me whether, for you, the reason is very important, somewhat important, or not important at all.

	Items	Very Important 1	Some-what Important 2	Not Important 3
1.	**Because I enjoy having a small baby**			
2.	Because I want to have (a boy/another girl)			
3.	To be sure that in my old age I will have a child to help me			
4.	So that there will be one more person to help our family economically			
5.	Because my spouse wants more children			
6.	Because I want to be sure to have enough children survive to adulthood.			
7.	Because I feel that the chance of having successful child in life will be increased.			

F9 Often people feel two ways at the same time. They may have decided that they want another child, but still there are some reasons they would not like to have another child. Here is a list of reasons people sometimes give for not wanting another child. For each one, please tell me whether, for you, the reason is very important, somewhat important, or not important at all.

	Item	Very Important	Some-what Important	Not Important
1.	Because having children would be a financial burden for our family			
2.	Because another child brings a lot of work burden			
3.	Because I could not spend as much time together with my spouse.			

C. Economic Considerations

Now I would like to know about what kind of economic or material/objective help you get or expect from your children.
E1..E12 When the children are young (before marriage or start living alone):-

Sex of the Child	Conditionality of Education	Type of assistance expected from children					
		Objective/material		Financial		Physical	
		y = yes, n = no, U = uncertain	If yes indicate its importance as 1 = v. important 2 = just important 3 = slightly important 4 = Uncertain	y = yes, n = no, U = uncertain	If yes indicate its importance as 1 = v. important 2 = just important 3 = slightly important 4 = Uncertain	y = yes, n = no, U = uncertain	If yes indicate its importance as 1 = v. important 2 = just important 3 = slightly important 4 = Uncertain
Daughter(s)	Irrespective of education						
	If Educated above primary school						
Son(s)	Irrespective of education						
	If Educated above primary school						

E13..E25 **When children are grown up (after marriage or start living separately)**

Sex of the Child	Conditionality of Education	Type of assistance expected from children					
		Objective/material		Financial		Physical	
		y=yes, n=no, U=uncertain	If yes indicate its importance as 1=v. important 2=just important 3=slightly important 4= Uncertain	y=yes, n=no, U=uncertain	If yes indicate its importance as 1=v. important 2=just important 3=slightly important 4= Uncertain	y=yes, n=no, U=uncertain	If yes indicate its importance as 1=v. important 2=just important 3=slightly important 4= Uncertain
Daughter(s)	Irrespective of education						
	If Educated above primary school						
Son(s)	Irrespective of education						
	If Educated above primary school						

D. Birth control and Contraception

B.1 There are some techniques of delaying or preventing conception while the couples normally live together? Have you ever heard of such a method or a technique?

1./___/ yes, 2./__/No, 3./__/ no response
(Go to B.5) (Go to B.5)

B.2 What are (is) these/this technique?

1._____
2._____
3._____
4._____

B.3 Have you ever used any method of birth control.?

1./__/ yes, 2./__/ no

B.3 Do you approve the use of contraceptive methods by a married couple?
1./___/ yes
2./___/ No (why _____)
3./___/ It depends (On what? _____)

B.4 If you are told that these are methods of delaying or preventing conception would you approve the use of it by a married couple?

1. /__/yes, 2./__/No,(why?)_____
3./___/ depends(on what) _____

B.5 After conception sometimes abortion happens due to deliberate acts or spontaneously. Do you think abortion should be used to control birth?

1./___/ Yes, 2./___/ No, 3./____/ It depends (on what?

E. General Background Information?

G.1 In relation to the community you live in are you economically well off, just average or below average?

1./__/well off, 2./__/just overage, 3./_/below average

G.2 As compared to the economic standard of your parents family, do you think that you are:

1./___/well off, 2./_/just equal, 3./__/below

G.3 Are you engaged in any activity of producing service or material (expect the household work) during the past 12 months?
1./____/ yes, 2./___/No (why?)_____
_

G.4 In what type of activity are usually engaged?

1./_____/ Government, 2./____/ Trade/craftsmanship,
3./___/ Agricultural

G.5 Is your work place

1. near the house /___/
2. far from the house but near the locality of residence/__/
3. out of the locality /___/

G.6 Are you able both to read and write?

1/_____/yes, 2./____/No, 3./____/ with difficulty

G.7 Have you ever attended formal education?

1./____/ yes, 2./____/ No

G.8 What is the highest grade you completed?

_____grade.

G.9 Indicate your income and wealth

1. monthly salary or an estimate of it _____
2. land holding
3. Cattle holding _____adult cattle + _____ calves
4. Sheep and Goats _____

G.10 Have you ever been living in urban area before now?
1/__/ yes (for how long)_____
2/___/no

G.11 Condition of housing

11.1 Wall made of Mud /____/ Stone with cement /_____/ Other /____/

11.2 Roof made of Grass /____/ Corrugated Iron /_____/ Other /_____/

11.3 Floor made of Cement/Tiles /_____/ Wood /____/ soil /___/

G.12 Number of rooms possessed by the family _____

Toilette /____/
Water supply /___/
Kitchen /____/

G.13 Presence of status indicator items in the house of the respondent:-

		Yes	No
1.	Set of table & Chair	/___/	/___/
2.	Radio /Radio Tape recorder	/___/	/____/
3.	Television	/___/	/___/
4.	Telephone connection	/__ /	/__/

DECLERATION

I, the undersigned, declare that this thesis is my work and that all sources of materials used have been duly acknowledged.

Name: Yohannes Hilawe Gebregzeabher

Signiture: 

Addis Ababa, June 17, 1994