ADDIS ABABA UNIVERSITY
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SOCIO-ECONOMIC FACTORS INFLUENCING FERTILITY LEVELS AND DIFFERENTIALS IN ETHIOPIA: THE CASE OF SHEWA REGION

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Socio-Economic Factors Influencing Fertility Levels and Differentials in Ethiopia: The Case of Shewa Region

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DEDICATION

I dedicate this piece of work to the memory of my late father, Berhanu Gashaw, who kindled the light and inculcated the value of education in my mind.

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ABSTRACT

The main objectives of the present study are to determine the level of fertility on the one hand, and to examine the extent of the relationships between some selected socio-economic factors and fertility on the other, in Shewa region of Ethiopia. To this end, a 5 per cent stratified simple random sample of women aged 15 to 49 years is drawn from the 1984 population and Housing Census of Shewa region. The sample consists of all the relevant socio-economic and demographic information of 80528 eligible women.

In the thesis, the sampling design is discussed, the reported age and fertility data are evaluated, the relationships between and socio-economic factors and fertility are examined; and the relative importance of each of the socio-economic variables considered are determined. Also summary of the main findings and their policy implications are presented.

The evaluation indicates that the fertility data are subject to under-reporting/omission of births and hence the Brass P/F ratio method and the relational Gompertz model are employed to adjust the reported fertility estimates. The new fertility estimates are appraised and show that the level of fertility in shewa as well as in its urban and rural areas is quite high. According to these estimates, women in total and rural shewa bear, on the average, more than 7 children before the end of their reproductive period (i.e 45-49 years); while the corresponding figure in urban areas is about 6.5.

In order to examine the relationships between socio-economic factors and fertility in the region, three procedures: univariate, bivariate and multivariate analyses are adopted. In all the procedures the mean number of children ever-born is used as a dependent variable and the socio-economic factors as independent variables. On the whole, the findings indicate a negative relationship between urban residence and fertility; education and fertility; economic activity (occupation) and fertility; and a positive relationship between duration of continuous residence of migrants and fertility. The findings also suggest fertility differentials by migration status, marital status, province of residence, religion and ethnicity. It is, however, observed in the multivariate analysis that, when the effects of the specified variables are held constant, the range in fertility differentials is reduced. This, therefore, suggests that much of the fertility differentials could be accounted for by differences in the socio-economic and demographic characteristics of the women under study. The analysis further reveals that among the selected predictor variables, marital status, province of residence, migration and ethnicity are the most important factors accounting for the greatest proportion of the variance in fertility. Education, occupation, urban/rural residence and religion are also important but to a lesser extent.

Finally, the policy implications of the findings are discussed and recommendations for immediate intervention are forwarded. Moreover, a detailed study of the relationships between social, economic, cultural and demographic factors and fertility in Ethiopia is recommended.

CHAPTER I

INTRODUCTION

1.1 Overview and Research Problem

Fertility, as a complex process responsible for the maintenance of society, is the single branch of demography which has been a focus of the most intensive, rigorous as well as numerous studies for some time now in many countries of the world.

The reason for this is, indeed, understandable. It is a widely held belief among social scientists in general and demographers in particular that the solution to the riddle of alarming population growth, especially in the developing countries, lies in the domain of fertility. It is believed that within the limits established by physiological factors, a number of socio-economic, demographic and cultural factors are the ultimate determinants of the levels of fertility and hence accounting for differentials among the population groups and sub-groups.

Although fertility has long been studied and identified as one of the three components of population growth-the other two being mortality and migration, its dynamic character in determining the pace of a population increase was only realized after world war II, when many countries in the world achieved a remarkable and rapid decline in mortality. This phenomenon, therefore, resulted in unprecedented increase in the world's population; 90 per cent of which is in the contemporary developing countries. Growth rates of many countries at present depend on the levels of fertility and mortality and are not affected much by migration.

In the developing countries mortality has declined considerably, and is expected to decline further. Birth rates in these countries, however, have not declined correspondingly; as a result, these countries are experiencing an extremely rapid population growth which, as many demographers believe, is a threat to programmes of social and economic development. Although the rate of population growth could be brought down through declines in birth rates, it is realized that all efforts at bringing down the fertility rate would be successful only if the cultural, social, economic, demographic and biological factors that determine the level of fertility are identified and understood.

This realization, therefore, gave an impetus to the study of fertility behavior in many developing countries. Accordingly an increasing number of demographic studies, having their primary purpose of analysing differentials and correlates of fertility, have been undertaken in these countries in the last four decades.

In spite of efforts, however, the existing knowledge about fertility behavior is inconclusive. Apart from the substantive issues, methodological challenge in the link between socio-economic, demographic and cultural variables, on the one hand, and fertility on the other, also constitutes an important problem that warrants the attention of researchers. Lack of a well defined analytical framework, coupled with the scarcity of adequate and reliable data required for this type of analysis are among the critical gaps due to various considerations.

In general, although fertility is identified as the most critical component of the rapid population growth in most developing countries and that a solid understanding of these

factors is necessary for designing effective fertility reducing policies and programmes, the set of factors that determine the levels of fertility and their variations among the population groups and sub-groups of these countries appear uncertain. Therefore, as many demographers do believe, there is still a dire need to make in-depth studies on the various aspects of human fertility in different social, economic, cultural and political settings.

Ethiopia is one of the countries experiencing a very high rate of population growth. With an estimated population of about 52.28 million in 1991 [CSA, 1989:7], it stands as the third and twelfth most populous country in Africa and the world, respectively. The trend also shows a rapidly increasing population overtime; from an annual growth rate of less than 1 per cent at the beginning of this century to about 2 per cent in the mid 1950s. Thereafter, growth rate of the population has been increasing steadily and reached the level of about 3 per cent in 1991 [CSA, 1988:20]. And yet, projections show the continuation of the upward trend in the population growth for quite some time to come. Based on the current and projected trends, the population of Ethiopia would double within a quarter of a century [CSA, 1988].

In fact, as indicated elsewhere [see Arowolo, 1990], the major cause of such a tremendous population increase in the country, as elsewhere, is the persistently high level of fertility and a gently declining level of mortality. Available evidence shows that the level of fertility in Ethiopia is among the highest in the world and has remained persistently so over the years, with

no sign of a down-turn in the immediate future. Crude birth rate stands at an average of 47.0 births per 1,000 population,while total fertility is put at 7.5 children per woman between 1990 and year 2000 [Arowolo: 1990]. The level of mortality, on the other hand, has been gently declining from about 27 to 18.1 deaths per 1,000 population in the past three decades and is expected to decline further in the near future as a result of increasing medical and public health services provided both by national and international agencies [Arowolo, 1990:22; CSO, 1984:81].

With mortality declining and with that trend expected to continue, the future course of fertility will determine the pace of increase of the population of Ethiopia in the coming years. Thus, unless active policy measures are taken to curb the prevailing high level of fertility and thereby to reduce the excessive population growth, it is conceivable that the country will confront such rapidly-increasing demands for food, energy, housing, health services, education and employment, etc. in the near future that it may find it difficult to meet.

It is indeed in view of this fact that the Ethiopian government has prepared a draft National Population Policy. The success of such a policy, however, depends on how well the factors that affect fertility are studied and understood. Besides their importance in understanding the dynamics and trends of the population, the factors are also crucial in terms of identifying causes of reproductive behavior and hinting at the proportions of each group that may present in the future generations. Moreover, knowledge of these factors is important in assisting planners and policy makers in how best to modify population variables in the

development plans and also in assessing the feasibility of implementing alternative programmes for influencing population dynamics [Arowolo and Ekanem, 1989].

In Ethiopia, however important they are, national studies on differentials and correlates of fertility have not been undertaken so far, mainly because of the absence of reliable and adequate population data. In fact to this writer's knowledge, there are some studies on fertility levels and differentials which covered limited areas of the country [see Genet, 1987; Alemtsehay, 1988; Alemseghed, 1989; Abdulahi, 1989; Assefa, 1990]. Nevertheless, only a few of them have systematically treated the effects of some of the socio-economic, cultural and demographic factors on the levels of fertility using refined analytical techniques.

Based on data from the 1981 Rural Demographic Survey, conducted by the Central Statistical Office (CSO), Genet[1987] in Gondar and Hararghe; and Alemtsehay[1988] in Illubabor and Wollo regions, examined the levels and differentials of fertility and child mortality. Apart from confirming the existence of fertility differentials between the two regions, and population sub-groups, classified by ethnicity, religion, literacy and marital status within the regions using simple descriptive methods, the studies did not attempt to investigate the most important factors accounting for fertility variations using multivariate analytical framework.

Alemseghed [1989], in a case study of one kebele, tried to investigate fertility differentials in Addis Ababa. He took a sample of 588 persons from data collected by another researcher

in 1987, and focused on three main aspects of socio-economic factors, namely: education, female labor force participation and ethnicity. The conclusions drawn from his findings are, nevertheless, doubtful, since it is difficult to give concrete generalization about the total population of Addis Ababa, based on 588 cases alone. They can not represent the characteristics of the population of the city.

Abdulahi [1989] examined the levels and differentials of fertility in three purposively selected areas in the country - Mettu, Alemaya and Addis Ababa - using data from a survey conducted by himself and his co-researcher in 1976/77.

Despite its systematic investigation of the subject using some analytical methods, the study did not attempt to determine the relative importance of the selected explanatory variables in terms of explaining variation in fertility based on multivariate statistical techniques. But, as is well known, knowledge of the degree of association of some variables with fertility relative to the others controlling for the effects of other factors, is of great importance for formulating effective fertility reducing programmes. Moreover, some of the most important socio-economic correlates of fertility, like migration and occupation of a woman, were not included in this research. Studies conducted in other parts of the world, however, suggest that such variables have considerable effect on the level of fertility and hence could account for some of the variations in fertility [Ekanem, 1974].

Assefa [1990], using data from the population, Health and Nutrition project baseline survey, conducted by the Ministry of

Health in 1986, investigated fertility levels, trends and differentials in two administrative regions, Arssi and Shewa, in central Ethiopia. He used indirect demographic techniques and period cohort analysis of birth histories for estimating fertility levels and trends in these regions. He also applied multiple classification analysis (MCA) for examining fertility differentials among the population sub-groups classified by region, place of residence, literacy, religion and ethnicity.

However, probably due to lack of data, he did not examine the influence of some of the most important socio-economic factors, such as female labor force participation and migration on the level of fertility. Moreover, because of the smallness of the proportion of the population belonging to different religious groups, he classified the population into two groups: Christians and Muslims. Such a classification, however, does not allow examination of the probable fertility differences between Orthodox, Catholics and Protestants.

In general, while the findings of these studies indicate some evidence regarding fertility levels, trends and differentials in some parts of the country, they fail to provide adequate information about the sets of factors that are responsible for the high reproductive performance in Ethiopia. In other words, in spite of the generalizations and conclusions drawn from the few studies that exist in the country, the socio-economic factors that maintain high fertility patterns in Ethiopia are not yet fully understood and hence constitute an area of further research.

The present study is, therefore, an attempt to fill some of the gaps in this regard. Under the given conditions and available information about demographic and other socio-economic variables in the 1984 national census of Ethiopia - the first ever conducted census, the study investigates the most important socio-economic factors that are likely to be associated with the level of fertility in a selected area of the country. In fact, in light of the existing knowledge and the frequency of the studies made on fertility, one would have very much liked to cover all regions of the country. However, because of the delay in the availability of the 1984 national census results for the entire country this was not possible and consequently, the study is limited only to one region- Shewa administrative region of Ethiopia. The selection of Shewa among the regions for which census results have already been available, is based on the following considerations.

- It has the highest population size- about 20 per cent of the country's total population;
- Since it is relatively more urbanized, it is possible to make a clear delineation between urban and rural areas in the region; and
- Besides its location in the central part of Ethiopia, it is more heterogeneous in terms of population composition and hence more preferable for a study such as this.

Thus, in a case study of Shewa region, the study attempts to provide an insight into the relationships between socio-economic variables and fertility in Ethiopia. The section that follows presents a brief review of literature on the subject under study.

1.2 Review of Related Literature

Major research efforts over the past several years have attempted to identify and understand the social, economic and demographic factors that affect the level of fertility among the population groups and sub-groups in developed as well as developing countries. Apart from confirming that developed countries have low fertility and developing countries have high fertility, these studies on the whole, have also thrown some light on the relationships between the social, economic and demographic variables on the one hand and the level of fertility on the other. In this section therefore, an attempt has been made to briefly review some of the important socio-economic variables, which are in some way or the other, related to the prevailing level of fertility in most of the third world countries.

1.2.1 Region of Residence

Region of residence is often cited as one of the factors which affect the level of fertility in a society. Caldwell [1979:36], for instance, distinguished some ecological patterns of low and high fertility zones in Africa. According to him, the low fertility areas are the Middle and Northern East Africa; and the other part of Africa are characterized as high fertility zones. The low level of fertility in Middle Africa is attributed to the involuntary infertility (Pathological childlessness); while that

of the Northern east Africa is associated with voluntary infertility.

Other country specific studies also indicate the existence of regional fertility differentials. Romaniuk [cited in Mabogunje and Arowolo, 1978:19] observed a striking fertility differentials among the regions of Zaire. According to him, these differences are associated with childlessness caused by the prevalence of sexually transmitted diseases. Another recent study on the determinants of cumulative fertility by Agyei and Mbamanya [1989:137] also found variation in fertility among the provinces of Kenya. They attributed most of the provincial variations in fertility in Kenya to the variations in the other predictor variables such as age at first marriage and marriage disruption. Studies conducted in Ethiopia, also, indicated the existence of fertility differences among the regions and sub-regions of the country [Alemtsehay, 1988:2; Genet, 1987; Assefa, 1990]. The possible explanation for the observed fertility differentials, according to these studies, are differences in the socio-economic and demographic factors such as age at marriage, and incidence of primary and secondary infertility.

Generally, despite the differences in explanations, most studies in the area of fertility show that region of residence is an important variable in fertility differentials research as it captures a sizeable amount of variation.

1.2.2 Place of Residence

Urban/rural residence is among the most widely studied variables affecting individuals' fertility. Many studies in the developing countries show that differences in place of residence are related to differences in fertility. The differences in levels of fertility have not, however, been stable or consistent in many of these countries.

In Latin America and the Caribeans, similar to the pattern in the developed countries, higher rural fertility has been observed. In Africa, Asia and Oceania, however, several patterns have been noticed. In some countries, fertility is lower in urban than in rural areas; in other countries, fertility is higher in urban than rural areas; and in still others differences in urban/rural fertility are not clear cut [UN, 1987:188].

Using multiple classification analysis and data from the 1977-78 Kenyan Fertility Survey (KFS), Agyei and Mbamanya [1989:135-144] for instance, found lower urban than rural fertility. Other similar studies in some parts of Africa also showed lower urban than rural fertility in the countries concerned [see for instance, Ekanem 1974; Caldwell, 1971]. In Ethiopia also there is an indication of lower urban than rural fertility [CSO, 1984:99: Assefa, 1990:255].

Contrary to the foregoing, others have found higher fertility in urban than rural areas in some African countries [see Mabogunje and Arowolo, 1978:29]. Recently, based on the WFS data fertility differentials have been studied between residents of large urban, other urban and rural areas of the developing

countries. According to this study fertility differences by urban/rural residence are almost negligible in Bangladesh, Indonesia, Mauritania, Pakistan, Sri lanka and Trinidad and Tobago [WFS, 1984:13]. In Haiti, Indonesia, Mauritania, Nigeria and Senegal major urban areas are reported to have higher fertility than smaller urban areas.

These inconsistencies in urban-rural fertility differences in developing countries might be attributed, in addition to differences in data quality and methodological issues, to several definitional and conceptual problems. On the one hand, the concepts have no universal application; on the other, the level of socio-economic development further introduces complications to the characteristics of urban and rural areas. For example, the level of literacy, occupational diversity, ethnic heterogeneity, religion, income, size and age of city as well as other Psychological and socio-cultural variables are not uniform even among cities within a country.

It has been also argued that the direction and magnitude of rural/urban fertility differences change in the course of modernization [UN, 1987:189]. At the initial stages, for example, urban fertility tends to be higher than rural fertility, or little or no fertility difference might exist. There is little practice of fertility control, and fertility is high in both urban and rural areas. Moreover, the traditional values and norms of child -spacing fade away without being compensated for by contraceptives. Under these conditions, higher urban than rural fertility might be expected. A small fertility differential might also be expected due to rural/urban

differences in marriage patterns, health and other factors that have a non-intentional impact on fertility. During the traditional phase, larger rural/urban fertility differentials are expected [UN, 1987:189].

Despite these inconsistencies, attempts have been made to give explanations for the existing fertility differences between urban and rural residences. One of the attempts in this direction is the classical explanation for the lower urban than rural fertility i.e. the so called "urban mentality" [Alemseghed 1989:13-15]. According to this explanation, family life in cities is believed to be less cohesive than in rural areas and children are less of an earning asset in urban than rural areas. Thus, these conditions encourage urban couples to better appreciate the opportunity cost of child bearing.

Others however, contend that this "urban milieu" or "urban mentality" that results in lower fertility may not be operational in the developing countries as urban centers in these countries are largely composed of recent rural in-migrants with their traditional norms and beliefs that favor large family size [Alemseghed 1989:13-15]. At the outset, therefore, it should be noted that the existing studies could not fully explain fertility differentials by urban and rural residence status.

1.2.3 Education

Education is known to be the single most important variable accounting for a large reduction of fertility in those countries which have experienced fertility decline; and still remains to be

a significant variable affecting fertility behavior in present times. Most studies on the relationship between education and fertility in the developing countries indicate that the two are inversely related and in many situation education appears to be one of the variables which have strong relationships with fertility. In Africa, for instance, several investigators [Agyei and Mbamanya, 1989; Ekanem, 1974; Caldwell, 1971; and others] found a strong negative relationship between education and fertility. In the Ethiopian context, available evidence also indicate the existence of an inverse relationship between literacy status of women and fertility [Genet, 1987; Alemtsehay, 1988, Abdulahi, 1989; Assefa, 1990].

The influence of education on fertility, according to many authors [see Mabogunje and Arowolo, 1978], operates through several channels. Prolonged schooling necessarily raises age at marriage; and with rising age at marriage, fertility tends to decline. Education also tends to increase knowledge of favorable attitudes towards practice of family planning and contraception usage. Educational attainment is also related to occupation and income. With higher education, opportunities for higher income professions and white collar occupation can be expected. Also, education affects fertility by reducing infant and child mortality. All these are pertinent to the adoption of the small family norm or reduced fertility.

It is, indeed, argued that education of women has a more negative effect on fertility than education of men [Cochrane, 1979; Cochrane, 1983]. Based on summaries of the results of several household multivariate studies, Cochrane [1983] concludes

that the effect of wife's education is negative more often, and more likely to be statistically significant than the effect of husband's education.

There is, however, evidence that this negative effect does not appear until higher levels of education are reached. Studies conducted in some developing countries often found highest level of fertility not among women without education, but among those with a few years of schooling [see Mabogunje and Arowolo, 1978]. According to these studies, a few years of education may lead to declines in breast feeding or improvements in health care, which are not offset by such fertility inhibition factors, as marriage delay and contraceptive use.

1.2.4 Female Labor Force Participation

It is commonly hypothesized that increased labour force participation of women has a negative effect on fertility. The theoretical explanations given for the relationship between women's employment and fertility emerge from complementary hypotheses: the role - incompatibility and the opportunity cost hypotheses [UN, 1987:256; Kasarda et.al., 1986:109]. In fact, both hypotheses make similar predictions concerning the relationship between employment of women and fertility.

According to the role incompatibility hypothesis, women engaged in non-domestic enterprises have a conflict between work and reproduction. They find the care of children more difficult than those not working and hence tend to reduce than the not-working group. It is hypothesized that the more incompatible the roles

of mother and worker are, the more negative the employment-fertility relationship will become. In other words, if it is difficult to combine both child-rearing and employment, an inverse relationship between work and fertility will emerge. However, if there are no such constraints, there will be no relationship between these two variables [UN, 1987:256].

The second hypothesis focuses on the opportunity cost of children. According to this hypothesis, as the opportunity cost of children increases due to increase in labour market opportunities for women, fertility will decrease [UN, 1987:256]. In other words, under conditions where the decision to have a child involves cost or trade-offs (both time and financial), women will tend to have fewer children. Since role incompatibility increases with rising opportunity costs, these two hypothesis are consistent.

A great deal of empirical work has been done in both developed and developing countries. Accordingly the assertion that women's employment is negatively related to fertility receives support from these studies in more developed countries. In developing countries, on the other hand, evidence regarding this relationship has been far from conclusive. Some studies indicate an inverse relationship; other suggest a positive relationship; some find no evidence of association. In his study made in Ethiopia, Abdulahi [1989] found lower fertility among the economically active women than those who are not active in two areas: Mettu and Addis Ababa.In Kenya,too, Agyei and Mbamanya[1989:139] report that the economically active women had lower fertility than non-working women. Other studies [see

Davidson, 1977; Gendell, et al, cited in Kasarda, et. al 1986], also found an inverse relationship between the two variables.

Contrary to the foregoing, Peek, [1975: cited in Kasarda et al, 1983], in his study of 4,000 Chilean families, found a positive relationship between family size and labor force participation for the modern and traditional sectors. Similarly, Lee and Cho [1976: cited in Kasarda et al, 1983] reported a slight but positive relationship between fertility and labor force participation in Korea.

Others have failed to find an evidence of a relationship. In their studies in Nigeria, Ohadike (1976) and Arowolo (1976) [both cited in Mabogunje and Arowolo, 1978], for example, could not come with any clear cut pattern of fertility differentials among the identified occupational categories of women. Alemseghed [1989] in one kebele of Addis Ababa also found no substantial fertility differences between the fertility of women who are employed and those who are not.

The apparent inconsistencies in empirical findings for developing countries, according to Kasarda et. al., "may be attributed not only to difference in defining employment but also to overall degree of development". It is generally agreed that a certain level of economic development is necessary before a relationship emerges between employment and fertility [Kasarda, et. al., 1986: 113]. In line with this, Kasarda [1971:307-17] contends that high female labor force participation can be quite compatible with high fertility if the economy is subsistence, where households are the primary units of productivity. Nevertheless, as the economy approaches the commercial -

industrial type with separation of home from work place, female labor force participation and high fertility come into conflict and hence fertility becomes lower when women are employed in non-familial enterprises, but not when work is done in the home.

1.2.5 Migration Status

The effect of migration on fertility has been considered in many studies; and based on the theoretical orientation's which have guided much of the research into this area, it has been generally postulated that fertility should vary by migration status to the extent that migrants are assimilated into the culture and hence fertility pattern of the receiving area [Ekanem, 1982; Oberai, 1986]. This is particularly true if the areas of origin and destination differ with respect to reproductive norms and behavior.

In their study of the Indian Punjab, Oberai and Singh (1983) found that urban migrants had higher fertility than the urban natives but lower than the rural non-migrants. In rural areas they showed that out-migrants and returned-migrants have lower fertility than non-migrants. Based on data from Nigeria, Ekanem [1982] found that in-migrants in the city have high fertility than the natives.

A study of about 800 rural-to-urban migrants, rural non-migrants, and urban non-migrants in Ghana revealed that migrants had lower fertility than rural non-migrants before they moved, but migrants' fertility fell further after they moved and came close to that of urban non-migrants [Ankarah, 1979].

In her study of differentials and correlates of fertility in Arssi Region of Ethiopia using data from the 1984 census of Ethiopia, Almaz [1990] examined the relationship between migration status and fertility in Arssi region of Ethiopia. She divided the women of child-bearing age into three categories: Interregional migrants, which comprises recent and long term migrants; Intra-regional migrants, also consisting of recent and long-term migrants; and non-migrants. Accordingly, she found that the fertility of non-migrants is lower than the fertility of both inter-regional and intra-regional migrants. Nevertheless, the fertility of interregional migrants is found to be slightly lower than that of the intra-regional migrants. Moreover ,among the inter-regional migrants, the recent migrants had higher fertility than those of long-term migrants. The reverse is, however, observed in the case of the intra-regional migrants. In fact in both categories, the fertility of long-term migrants is substantially higher than that of the non-migrants.

In sum, many researchers agree that migrants acculturation into the area of destination coupled with their aspirations for social mobility in the new setting in time will lead to a lower fertility, particularly if they are in a city. The changes in migrants' fertility related attitudes and behavior, however, depend on personal demographic background factors, which include attitudes toward children, knowledge about reproduction and birth control, etc. [Card, 1978:459-476].

1.2.6 Marital Status

The impact of marital status on fertility has been considered in a number of studies. And it appears that women experiencing dissolution have fewer children at the time of their divorce or widowhood than those in stable marriages. Besides, in almost all societies the majority of births take place within marriage; hence it is clear that age at marriage and duration of marriage are the most important determinants of fertility [Monsted and Walji, 1978:95]. Moreover, although many children are born outside culturally accepted marital unions, structural changes in the frequency and timing of marriages have been often cited as factors influencing fertility levels in many societies [UNECA, 1979:269].

Studies in Africa show that, consistent with the foregoing, fertility is higher among married women than all women together. In Mauritius, for instance, fertility has been found to be higher for married women than all women during the period 1962-1972. Data from the 1984 Demographic Survey of West Cameroon also show a higher fertility level for married women than all women [UNECA, 1979:265].

Evidence in Ethiopia also revealed that currently married women had significantly higher fertility than those of widowed and divorced women [Genet, 1987:76; Alemtsehay, 1988:46; Abdulahi, 1989].

1.2.7 Ethnicity

Like other socio-economic and demographic factors, tribal affiliation (ethnic origin) is known to affect reproductive behavior. Many studies (for instance those by Gaisie, 1975 and Henin, 1973) showed fertility differences among various ethnic groups living in similar economic and environmental conditions.

Gaisie [1975:345] identified three fertility levels among the major tribal groups in Ghana. According to him, the differences in fertility levels between the tribes are the results of a multitude of factors such as education, degree of urbanization, distorted sex ratios, superstitions leading to differential reporting of vital events and so on.

Using the 1973 national Demographic survey, Henin [1973: cited in Alemtsehay, 1988:36] found substantial fertility differences among nine major tribes in the United Republic of Tanzania. In the Sudan also, fertility had been reported to vary between different ethnic groups [Demeny, 1968 cited in Richard, 1979:37]. Accordingly, the Nilotic group had higher fertility than the Arabs and other ethic groups.

Studies conducted in Ethiopia also showed the existence of fertility differences by ethnic groups. Using a sample data from one kebele in Addis Ababa, Alemseghed [1989], for instance, examined the effect of ethnicity on fertility. From the different ethnic groups he considered, the Amharas are found to have the lowest level of fertility while the Gurage had the highest level of fertility. These apparent differences, according to him, might be due to differences in other variables

such as age at first marriage, use of contraceptives, and duration of marriage [Alemseghed, 1989: 67-77].

An analysis of the 1981 Rural Demographic Survey data for Illubabor and Wollo regions of Ethiopia by Alemtsehay [1988] also showed fertility differentials among the identified ethnic groups. The explanation given for the observed differences in fertility among the different ethnic groups include differences in primary and secondary infertility, age at first marriage and geographic position. Other recent studies [Abdulahi, 1989, Assefa, 1990] have also documented significant fertility differentials among the ethnic groups they considered.

1.2.8 Religion

Among the various socio-economic and cultural factors influencing fertility, religion has been considered very important. Religion, prescribes a code of life, refers to a system of attitudes, beliefs and practices that individuals share in groups and through this orientation towards life and death, is known to affect individual's fertility behavior. There has been rejection of any interference in the natural process of conception and birth by all pronatalist religions. The Catholic rejection of artificial birth control is well known. According to this religion, the aim of sexual intercourse in marriage is the procreation of children and any human interference with the natural process of coitus and conception is therefore contrary to the laws of God and must be condemned as gravely sinful [Seyoum, 1989].

Studies conducted in various culture areas of the world show fertility differentials among the various religious groups [UN, 1973:93]. Some studies undertaken in a number of less developed countries, comparing Muslim with non Muslim fertility, indicate that, on the whole, Muslim fertility is higher than non-muslim fertility [UN, 1973:105]. It is, however, pointed out by these studies that in rural areas differences in fertility levels between Muslims and non-Muslims are almost negligible. In fact, differences become more pronounced among urban residents such as in Ghana where Muslim fertility is found to be much higher than non-Muslim fertility [UN, 1973:105]. Experiences in other African and Asian countries also appear to support the view that Muslims have generally higher fertility than that of neighboring people of other major religions [Ekanem, 1974]. There are, however, some studies that show lower Muslim than Christian fertility [see Assefa, 1990: 258].

In Ethiopia, where Christianity and Islam constitute the two major religious groups, there is also an indication of higher Muslim than Christian fertility. Using multiple classification analysis and data from the population, Health and Nutrition project baseline survey, Assefa [1990:259], for instance, showed that Muslim women had substantially higher fertility than those of Christians. Abdulahi [1989:213], in his study of fertility levels and differentials in selected areas of the country, also found higher fertility for Muslims than Christians. Similarly, a further analysis of the 1981 Rural Demographic Survey Data for Illubabor and Wollo regions of Ethiopia indicate that Muslims had higher fertility than those of Christians or traditional's in

both regions. Nevertheless, when the number of children ever-born are standardized for the effects of age composition, the results in Illubabor showed higher fertility for those adhering to traditional religions. The explanations given or the observed variations in fertility among the different religious groups are more or less similar to those which state that traditional Islamic way of life is culturally favorable to high fertility in the absence of voluntary restrictions of births within marriages. [Alemtsehay, 1988: 40-42]. At this point it should, however, be pointed out that although Muslim religious practices seem to emphasize the virtues of reproduction and large families, evidence relating Muslim religion to high fertility is still a subject of intense academic controversy [Ekanem, 1974].

It is however important to note at this point that, in addition to the variables mentioned above, there are other socio-economic and demographic variables which are related to the level of fertility in developing countries. These variables include: income/wealth, infant/child mortality, age at first marriage, duration of marriage, breastfeeding and contraception.

The effect of income on fertility has been considered in many studies and two types of arguments are identified. On one hand, it is argued that a rise in income affects tastes and values in such a manner as to reduce the number of children people want. That is, a rise in income increases individuals' aspirations for social advancement, which may be thought of as increased desire for other goods which compete with children for family resources. This would act to reduce the number of children people would have. Alternately it is also argued that a rise in income would

lead people to have more children, as they tend to buy more of of goods as their income increases. These arguments suggest that a rise in income affects fertility in both directions, and it may be difficult to determine in advance which aspect will predominate. Hence, there is no theoretical prediction of the overall effect of income on fertility [Simon, 1974:3-4].

Studies conducted in many countries suggest that patterns of child survival are interrelated with patterns of fertility. Levels and trends in child survival are negatively related with levels and trends in fertility [Preston, 1978]. However, the prevalent directions of causation, its mechanisms, timing and strength are not uniform in different populations. In societies where no deliberate birth control is practiced, and where breastfeeding of infants is widespread and extends for about two years, post-partum anovulatory period is prolonged. Thus, a decrease in infant mortality brings about an increase in the total infecund part of a woman's reproductive life cycle, longer inter-pregnancy intervals and a fall in fertility. It was also observed that infant/child mortality conditions influence fertility where couples replace a child they lost and where they have larger numbers of children in anticipation of such losses in order to ensure the survival of a certain number. Thus, a declining child mortality eventually has a depressing effect upon fertility [Preston, 1978].

Studies conducted to date have shown that age at first marriage is inversely related to fertility [UN, 1987:76]. These studies also indicated the connection between the age at first marriage and duration of marriage. Accordingly it is argued that the

younger the age at first marriage of a woman, the longer the time she would have spent in a marital union by the end of her reproductive period, which would imply high fertility. Nevertheless, the relationship between age at first marriage and fertility depends not only on the length of marital duration, but also, among other variables, on the deviation of the age at marriage from socially accepted norms relative to marriageable age [UN, 1987]. In general, it appears that the timing of marriage and the total number of years spent in a marital union are the most important factors influencing fertility especially where the use of contraceptives is not widespread.

Breastfeeding is commonly noted to have a relationship with fertility. Breastfeeding suppresses the ovulatory cycle of a woman and is a major source of protection against pregnancy particularly in non-contracepting societies [UN, 1987:104-126]. This might be due to the fact that the time between birth and the return of ovulation depends on the duration and intensity of breastfeeding. Thus, the patterns and duration of breastfeeding are important factors in determining the level of fertility in the absence of the prevalence of contraceptive use.

Use or non-use of contraceptives also affect the level of fertility in a society. It is usually argued that women who practice modern birth control methods have fewer children than those who do not practice. The use of contraceptives is, however, influenced by age, family size preference and desire for more children [UN, 1987:129].

In general, the aforementioned variables are important factors which account for variations in fertility among population groups

and sub-groups within and between countries. However, these variables are not considered in this thesis because the data are not available. This might constitute serious limitation in the analysis of this study particularly in the multivariate analysis.

1.3. Objectives of the Study

The broad objective of the study is to estimate the level and examine the socio-economic correlates of fertility in Shewa region.

More specifically, the study seeks to:

1. Determine the level of fertility for the Shewa region;
2. Investigate fertility differentials by classifying the female population aged 15-49 years into meaningful categories by province of residence (Awraja), urban/rural residence, educational attainment, activity status, occupation, marital status, migration status, religion and ethnicity;
3. Examine the independent effect of each of the selected socio-economic variables on fertility and thereby determine the relative importance of these variables in terms of explaining variation in fertility; and
4. Draw policy implication of the research findings and make some recommendations for immediate intervention.

Although the fertility situation in Shewa may not necessarily be duplicated in the other regions of the country, the findings are likely to throw some light on what may be general because of the heterogeneous nature of the population. Keeping this point

in view, the overall significance of the study is discussed below.

1.4. Significance of the study

The significance of this study could be considered both at individual and societal levels.

As frequently indicated in the literature, individual families are seriously affected by a high level of fertility through its effects on the health of both children and mothers, income of the families and other necessities of life. Hence, investigating the factors that maintain high fertility patterns would undoubtedly contribute to overcome the problems caused by high fertility and eventually contribute to the well being of the individual citizens.

Since Ethiopia is in a state of rapid transformation in practically all spheres of life, the demographic front is not an exception. Thus, accurate documentation of information on the levels, differentials and correlates of fertility would be essential for formulating pertinent population programmes with due consideration of the various facilities and social services in the face of the present circumstances. In addition to its significance in contributing to the knowledge on fertility in Ethiopia, which until now has been very scarce, the study would also indicate some areas of intervention on the current population problem and initiate further in-depth and large scale studies in the field of fertility in the country. It is for the reasons mentioned above that this study is timely and necessary.

1.5 Methodology

1.5.1 Hypotheses

On the basis of the review of literature, and most importantly on information available in the 1984 Ethiopian Census, we have formulated the following hypotheses to test their validity statistically.

i. Urban women tend to have lower fertility than their rural counterparts.

ii. Fertility decreases as the educational level of a woman increases; i.e the higher the level of education, the lower is the level of fertility.

iii. Women who are engaged in non-agricultural occupations are more likely to limit their family size than those in agricultural occupations.

iv. The longer the duration of continuous residence of migrants is, the more similar the fertility of migrants and non-migrants will become.

v. Attitudes and behavior conducive to high fertility are strongly influenced by people's cultural and religious perceptions. We, therefore, expect an association between ethnic origin and religious affiliation of women and their fertility.

1.5.2 Source of Data and Its limitations

The main source of data for this study is a 5 per cent sample of women, aged 15 to 49 years, drawn from the Population and Housing Census of the Shewa region conducted in May 1984 as part of the National Population and Housing Census of Ethiopia. The decision to take a 5 per cent sample of women is mainly due to the fact that the time and resources available do not permit for a detailed study of the whole female population of childbearing ages in the region. The sampling techniques adopted and the adequacy of the sample size for the types of analysis envisaged are discussed in detail in the next sub-section.

The 1984 Census covered almost the entire population of the region. For the purpose of the census, Peasant Associations in rural and Urban Dwellers' Associations in urban areas are delineated into enumeration areas. Accordingly, the region is divided into about 9,664 enumeration areas. The enumeration of all persons in these enumeration areas took about 15 days with effect from May 9, 1984, which is considered as 'Census Day' [OPHCC, 1989:ii].

Regarding the content of the 1984 Census questionnaire, most of the important questions recommended by the United Nations to be investigated in the 1980 round censuses are included. These are related to the social, economic, and demographic characteristics of the population as well as housing conditions of the region.

The questionnaire had two sets of information which could be used for fertility analysis: Retrospective fertility (data on children ever-born) and Current fertility (births in the last 12

months preceding the Census date to all women aged 10 years and over). Information collected on individuals include, among others, educational status of those 5 years and over, marital and activity status of those 10 years and over, and place of birth, religious affiliation and ethnic origin of all individuals in a household.

In spite of its wide coverage of topics, however, the census, did not collect information on some important variables like age at marriage and duration of marriage. Unavailability of data on these variables restricted our analysis. In addition, preliminary reports of census results for the region indicate the existence of errors in the age as well as current and retrospective fertility data. Thus, before doing the analysis, the quality of the data is examined.

1.5.3 Sampling Procedure

As indicated earlier, a 5 per cent sample of the target population (women in the age group 15-49) forms the basis of the present study. Besides other considerations, the estimated sample size is thought to be adequate in comparison with the sample size of previous studies undertaken in the country [see for example, Assefa, 1990; Abdulahi, 1989]. The basic idea in the design of the sample selection is, however, to get enough number of women in the childbearing ages so that the study becomes meaningful and valid with due consideration to time and resources.

The sampling design used in this study is a stratified simple random sampling. To adopt this procedure, all women aged 15 to 49 years (ie. the target population), numbering 1,632,658, together with their socio-economic and demographic characteristics, are first extracted from the total population of the region. These women are then stratified by Awraja (each of the 11 Awrajas of the region being a separate stratum) and within Awraja by urban and rural areas (urban and rural residential area of each Awraja are considered as sub-strata). Once the women are arranged in this fashion, a simple random sample is selected from the target population. And from each residential area of an Awraja, 5 per cent of the eligible women are selected randomly and their respective fertility and other relevant demographic and socio-economic information are copied. The overall sample size of the region, initially determined, is 81632 (see Table 1.5.3). Out of this number of women, however, 1104 are reported to be visitors, for which no information is collected in the census and hence excluded from the analysis. The present study is, therefore, based on the information obtained from the remaining 80528 women.

The age structure and other socio-economic characteristics of the sampled women and the representativeness of the sample as compared with total female population, aged 15-49 years, of the region are examined in chapter II.

Table 1.5.3

Reported and Sampled Number of Women Aged 15-49 Years, Shewa Awrajas 1984.

Awraja	Number of Women	
	Reported	Sampled
Chebo and Gurage	255905	12795
Haikoch and Butagira	278044	13902
Jibat and Mecha	161673	8084
Kembata and Hadiya	257828	12891
Menagesha	148969	7448
Menz and Gishe	59927	2996
Merhabete	57223	2861
Selale	100314	5016
Tegulet and Bulga	108499	5425
Yerer and Kereyu	142104	7105
Yifat and Timuga	62172	3109
Shewa	1,632,658	81,632

Source: Computer Printout for the Census Results of Shewa.

1.5.4 Methods of Analysis

The methods of analysis employed in this study are largely governed by the type and nature of data available and hence vary from a simple tabular representation to more refined analytical techniques. Regarding the descriptions of the methods and the conditions required for their application, a greater account is presented in the chapters that follow. To avoid mere repetition, therefore, the types of the techniques used in this analysis are discussed in this section.

For the purpose of this study, the level of fertility is measured by indices[1] such as Total Fertility Rate (TFR), Gross Reproduction Rate (GRR), General Fertility Rate (GFR), Crude Birth Rate (CBR) and mean number of children ever-born to women aged 45-49 years. While direct estimates of these fertility measures are possible from census data, most often the estimates turn out to be gross under estimates to be of any use for planning and policy purposes. Thus, indirect estimation techniques are applied to obtain adjusted estimates of the level of fertility in Shewa region. The techniques adopted here are the Brass P/F ratio method and the Relational Gompertz Model.

The analysis of fertility differentials is undertaken on the basis of univariate and bivariate procedures, i.e. without and with controlling the effect of other variables. In both procedures, the mean number of children ever-born per woman is used as index of fertility. Meanwhile, direct standardization

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[1]For the definitions of these indices, see Glossary.

technique is applied to eliminate the differences which may be attributed to some intervening variables such as the age composition of the women.

Finally, to measure the magnitude of the independent effect of each explanatory variable on the dependent variable(fertility) and thereby to determine its relative importance in explaining fertility , multiple classification analysis (MCA) is used. The variables included in the multivariate analysis and their operational definitions are discussed in Chapter V.

1.6 Organization of the Study

Including this introductory section, the report of this research work is organized in six chapters. Chapter two describes the general settings of Shewa region, with particular emphasis on the population, vegetation and climate, economic and political structure, etc., discusses the demographic and socio-economic background characteristics of the study population; and examines the quality of the data used in the analysis. The level of fertility in the region is estimated in Chapter three. In Chapter four, the analysis of fertility differentials, focusing on some selected socio-economic variables is presented. Chapter five, deals with the study of the socio-economic factors influencing fertility with a view to identify the most important correlates of fertility level in Shewa region based on a multivariate technique. Finally, in Chapter six, a summary of the main findings of the research, their policy implications as well as recommendations for further research are presented.

CHAPTER II

BACKGROUND OF SHEWA, CHARACTERISTICS OF THE STUDY POPULATION AND EVALUATION OF DATA

2.1 Some Background Information About Shewa

At the time of the 1984 census, Shewa is one of the sixteen administrative regions of Ethiopia[2], covering an area of about 85093 square kilometers (about 7 per cent of the total area of the country). It is located in the central part of Ethiopia, surrounding Addis Ababa, the capital city of the country, and lying approximately between 7^0 and 10.75^0 North latitude and between 37^0 and 40.5^0 East longitude. The region shares boundaries from the east and south east with Hararghe and Arssi, from the west, South west and northwest with Wellega, Keffa and Gojjam, from the north with Wollo and from the south with Sidamo regions [see fig. 2.1.1].

For convenience of administration, Shewa is divided into 11 Awrajas (provinces), viz: Chebo and Gurage, Jibat and Mecha, Haikoch and Butagira, Kembata and Hadiya, Menagesha, Menz and Gishe, Merhabete, Selale, Tegulet and Bulga, Yerer and Kereyu, and Yifat and Tumuga. These Awrajas are further divided into 108 Weredas; 5306 Peasant Associations (PAs) and 262 Urban Dewellers Associations (UDAs) [OPHCC, 1989]. The PAs and UDAs are the

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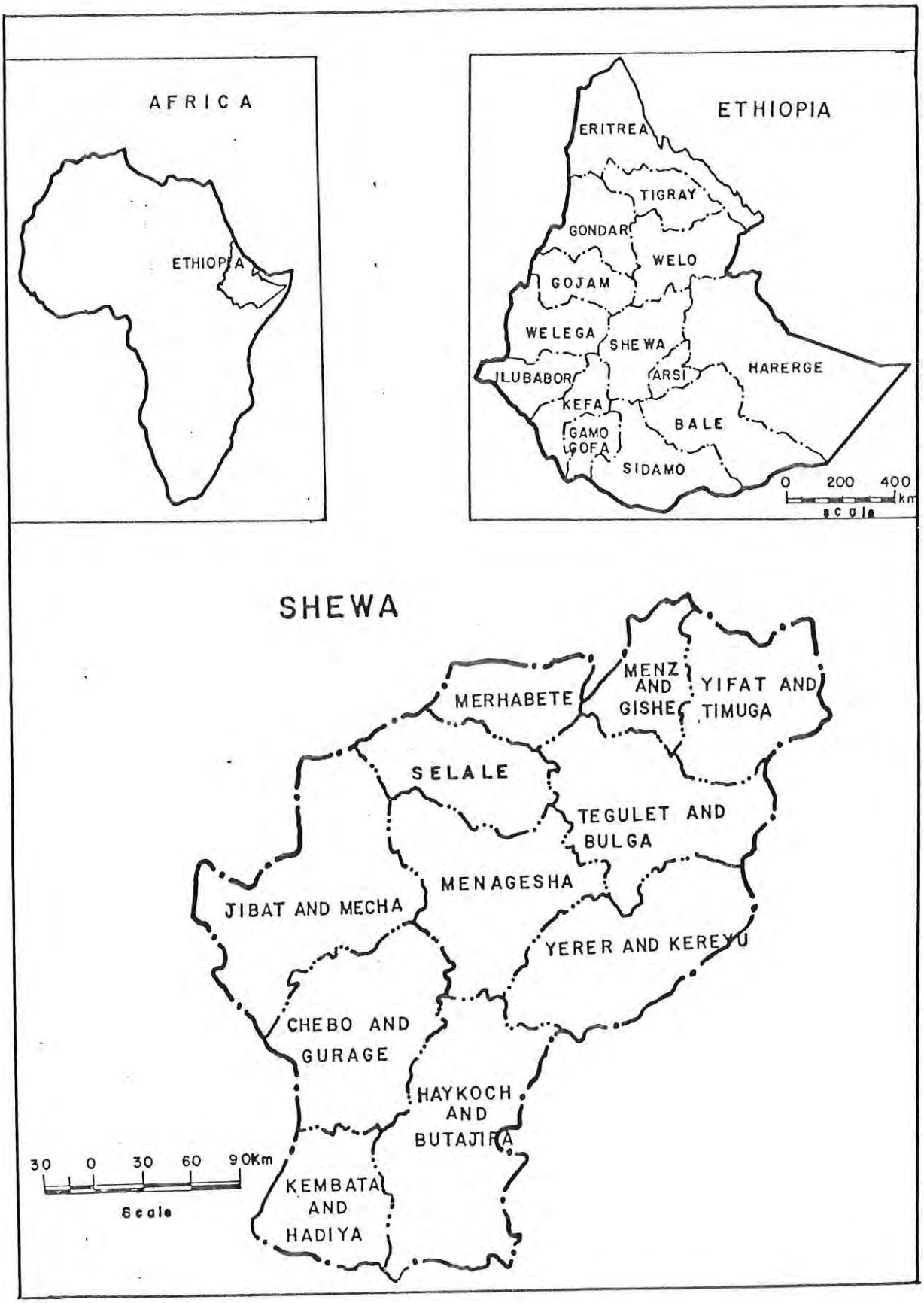
[2] Geographically the country was divided into 14 regions. However to facilitate administrative issues, the province of Assab, where the country's main seaport is located, and the city of Addis Ababa were also considered as regions and hence raised the total number of regions to 16. Following the division of the country in to 5 Autonomous and 29 Administrative Regions in September 1987, Shewa is subdivided into four separate administrative areas: East Shewa, West Shewa, North Shewa and South Shewa.

Fig. 2.1.1 Maps of Ethiopia and Shewa



lowest of administrative units in rural and urban areas, respectively.

Shewa is a region of great diversity in terms of landscape. The Great Rift Valley that runs along the eastern border of Shewa for all its length, the Omo (Gibe) gorge which forms the western border of the southern part of Shewa and the plateau areas, which are mostly found in Northern Shewa, are some of the physical features that distinguish the region from the rest of Ethiopia. The altitudes of the areas of the region range from below 600m in the Rift valley to about 3600m in the highlands of the region. Most of the areas, particularly those in Central Shewa, have altitudes above 2000m [FAO, 1984].

The topography of the region seems to exert considerable influence over the climatic situation that exists in the various areas of the region. The lowland areas of Shewa have mean annual temperature of 29°C. In the Central Shewa, the Southern and Central sections of the Rift Valley, and the gorges of the northern Shewa, the mean annual temperature is about 20°C; while in the plateaux of northern shewa, it ranges between 10 to 17.5°C [FAO, 1984].

Like the climate, rainfall in Shewa is also influenced by the topography. Accordingly, mean annual rainfall varies from below 500 mm in farther east to between 1500-2000 mm in the highlands of north east Shewa [FAO, 1984]. Although the region receives some rainfall during the period of March to May and in October, the rainfall is heavily concentrated in the three summer months of June, July and August [Mesfin, 1972].

Similar to other regions of the country, the economy of Shewa is essentially rural based and agriculture is the dominant sector in which the vast majority of the region's population derive their livelihood. As of 1984, for instance, close to 90 per cent of the population of the region live in rural areas and almost all depend on farming and livestock rearing [OPHCC, 1989:4 and 108].

According to the 1984 census [OPHCC, 1988], Shewa had a total population of 8,102,325 out of which 7,319,870 (90.3per cent) are reported to live in rural areas. The census further revealed that of the 8,102,325 population, 4,027,114 are males and 4,075,211 are females giving a sex ratio of about 98 males for every 100 females. On the basis of available data, the average growth rate is estimated at 2.95 per cent per annum for the early 1990s. Moreover, estimates from the various sources suggest that the population of Shewa might have increased more than two-fold, from about 3.9 to about 8.1 million, during the period 1967-1984 [CSA, 1988].

Shewa is a multi-ethnic region, inhabited by over 30 ethnic groups, which are distinguished by different cultures, religions and languages. The five largest ethnic groups are Oromo, Amhara, Gurage, Hadiya and Kembata. According to the 1984 census, they constituted about 41,23,18,8 and 5 per cent of the population of the region respectively [OPHCC, 1988:25]. The Oromos live in the central, Western and South Eastern Shewa; the Amharas mainly live in the northern and north eastern Shewa; the Gurages live in the South Western Shewa; and the Kembatas and Hadiyas mainly reside in the Southern Shewa.

Christianity and Islam are the two major religions in the region, while a very small proportion of the population adhere to Catholic and Protestant religions. The results of the census for the region indicate that in 1984, 67 per cent of the population are Orthodox christians and 23.4 per cent are Muslims. Protestants and Catholics accounted for 7.0 and 1.3 per cent of the population respectively. The population of other religious groups are but an insignificant minority, barely 1.2 per cent [OPHCC, 1988:27-28]. The domination of the Orthodox religion might be due to its recognition as the church of the empire from its establishment in the 4th century A.D. up to the eruption of the Ethiopian revolution in 1974.

Regarding population distribution, Shewa is the most populous region in Ethiopia. According to the 1984 census results, it is inhabited by about 20 per cent of the total population of the country. In terms of density, however, the region stood as the second most densely populated region, after Addis Ababa. Estimates from the 1984 census revealed an average density of about 95.2 persons per square kilometer for the region, while the corresponding figure for the entire country is 34.

Although the level of urbanization in Shewa has remained very low, it stood as the fourth relatively urbanized region in Ethiopia after Addis Ababa, Assab and Eritrea. In the 1984 census, for instance, about 9.7 per cent of the population of the region are reported to live in urban areas[3], while the corresponding figure for the entire country is 11.3 per cent. The relatively high rate of urbanization in Shewa may be

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[3]See Glossary for the definition of an "Urban Center"

attributed mainly to the relative industrial, commercial and administrative concentration in the region. As of mid 1986, for instance, more than 7 per cent of the industrial establishments and about 11 per cent of the industrial workers were concentrated in Shewa region [CSA, 1990:40-45].

The educational level of the population of Shewa, like that of the other regions, is still very low. According to the 1984 census, only about 23 per cent of the population of the region aged 10 years and above are literate (able to read and write). In fact, literacy rates are higher in urban (65.7 per cent) than rural (18.3 per cent) areas. The Primary, Junior and Secondary Schools enrolment ratios in 1984 stood at 39,33 and 11 per cent respectively, indicating that 61 per cent of primary, 67 per cent of Junior Secondary and 89 per cent of Secondary School age population of the region are still outside the purview of school system [OPHCC, 1989:75].

In Shewa, like in the entire country, the health status of the population is unsatisfactory. The wide spread chronic and acute conditions of morbidity promoted infections and parasitic diseases resulting in high mortality, especially among infants and children under the age of 5 years. By 1984, for example, this region exhibited an infant mortality rate of 111 per 1000 live births [OPHCC, 1989:149].

Although there has been a rapid expansion of health services in the past decade, there is only 1 health station for about 32936 people in Shewa region. As of 1986, there are 18 health centers and 10 hospitals with 882 beds. In the same year, the ratio of doctors to the total population is 1:212910. In the case of

nurses and health assistants the ratios are 1:40861 and 1:7995 respectively [MOH, 1986].

2.2 Characteristics of the Study Population

2.2.1 Province and Place of Residence

In the 1984 Population and Housing Census data on the residential background of a respondent is collected in the form Region, Awraja, Wereda, etc., for urban and rural areas separately. For the purpose of the present study only information about a woman's Awraja (province) and urban/rural residence status has been considered.

At the time of the census, as discussed above, Shewa is made up of eleven Awrajas. The distribution of the sample and total women by each of these Awrajas are shown in Table 2.2.1. An examination of this table revealed that the percentage distribution of the women ranges from 17 per cent in Haikoch and Butagira Awraja to about 3.5 per cent in Merhabete. The distribution of the total female population of the region by these Awrajas, as given in Table 2.2.1, also shows similar pattern to that of the sample. When the two distribution are compared to each other, it is observed that the corresponding figures are almost the same.

Regarding residence status, the women in the sample are classified by urban and rural areas on the basis of the definition of an urban area given for the purpose of the census (see Glossary for the definition).

Table 2.2.1

Distribution of Women Aged 15 to 49 by Awraja and Urban/Rural Areas, Shewa 1984

	Sample Population		Total Shewa
Awraja	Number	Per cent	Per cent
Chebo and Gurage	12713	15.8	15.7
Haikoch and Butagira	13718	17.0	17.0
Jibat and Mecha	7928	9.8	9.9
Kembata and Hadiya	12797	15.9	15.8
Menagesha	7285	9.0	9.1
Menz and Gishe	2970	3.7	3.7
Merhabete	2827	3.5	3.5
Selale	4952	6.1	6.1
Tegulet and Bulga	5353	6.6	6.7
Yerer and Kereyu	6931	8.6	8.7
Yifat and Timuga	3054	3.8	3.8
Residence Status			
Urban	8220	10.2	11.0
Rural	72308	89.8	89.0
Total	80528	100.0	100.0

Source: Computer Printout for the Census Results of Shewa.

The distribution of the women by Urban and Rural residence is presented in Table 2.2.1. It can be seen from the table that, while the majority (about 90 per cent) of the women in the sample are living in rural areas at the time of the census, only 10.2 per cent of them are reported to be living in urban areas. The

corresponding figures for the total female population of the region (aged 15-49) are 89 and 11 per cent, respectively. It is therefore, clear from the table that the two distributions -the sample and total women by urban/rural residence are comparable.

2.2.2 Age Composition

Table 2.2.2 and Figures 2.2.2a-2.2.2c show the distribution of the sample and total female population aged 15 to 49 years by five year age groups and urban/rural residence.

As can be observed from both the table and the figures, the percentage of women decreases considerably from the age group 15-19 to 20-24, then it increases in the age group 25-29, and it decreases gradually as the age increases. The same pattern is also observed in both urban and rural areas. The observed minor distortions in the age distributions might be due to misreporting of age and/or omission of some of the women in the age group. It could also be due to the effects of migration and sampling errors.

The majority of the women, about 92, 94 and 92 per cent in the region, urban and rural areas respectively, are below age 45. The oldest age group, that is 45-49, accounted only for 7.8, 6.6 and 7.8 per cent of the total, urban and rural women, respectively. The mean ages of the total, urban and rural women in the sample are 30.4, 29.2 and 30.6 years respectively, while the medians are 29.4, 28.0 and 29.5 in that order.

Table 2.2.2

Distribution of Women by Five-Years Age Groups and Urban/Rural Residence, Shewa 1984

	Sample Population						Total Shewa		
	Total		Urban		Rural		Total	Urban	Rural
Age Group	No.	%	No.	%	No.	%	%	%	%
15-19	14940	18.6	2023	24.6	12917	17.9	18.7	25.0	18.0
20-24	12118	15.0	1205	14.7	10913	15.1	15.2	15.1	15.2
25-29	13534	16.8	1265	15.4	12269	17.0	16.8	15.6	17.0
30-34	12812	15.9	1273	15.5	11539	16.0	15.9	15.1	15.9
35-39	11465	14.2	1178	14.3	10287	14.2	14.2	14.0	14.2
40-44	9399	11.7	733	8.9	8666	12.0	11.6	8.8	11.9
45-49	6260	7.8	543	6.6	5717	7.9	7.7	6.4	7.9
Total	80528	100.0	8220	100.0	72308	100.1	100.1	100.0	100.1
Mean Age	30.4		29.2		30.6				
Median Age	29.4		28.0		29.5				
x^2	3.18		3.91		1.98	$p<0.05$			

Source: Computer printout for Census Results of Shewa.

Note: Percentages do not to 100 due to rounding.

When the percentage distribution of the sample population is compared with that of the total female population of the region, it is observed that the differences in the percentages are minimal- the highest difference is 0.4 per cent. The same is true for the age distribution of women in both urban and rural areas. It may therefore, be said that the two distributions are comparable. This conclusion is also supported by the chi-square statistics computed from these age distributions (see at end of Table 2.2.2).

Fig. 2.2.2a Percentage Distribution of Sampled and Total Women by Five-Year Age Groups, Shewa 1984

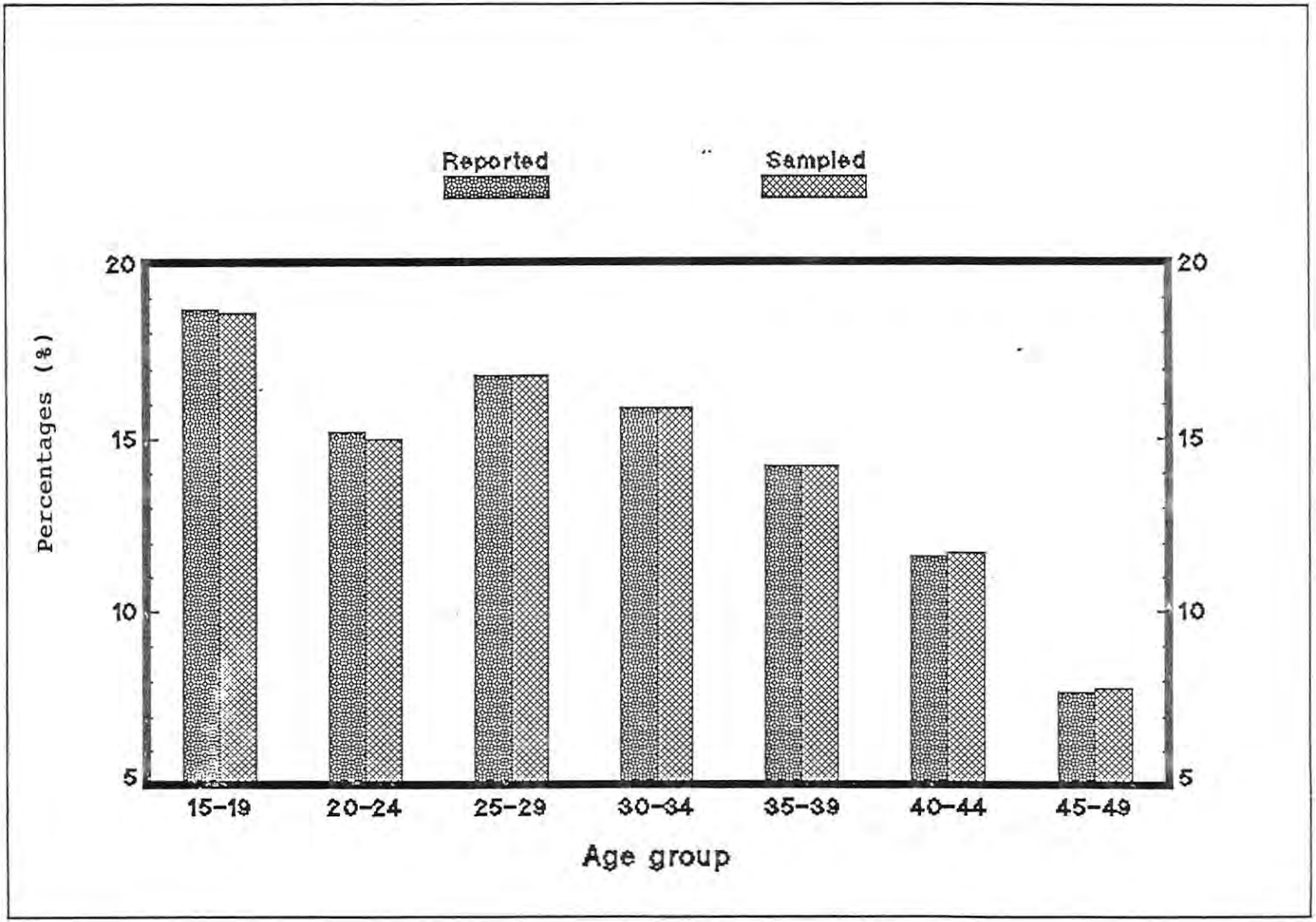


Fig. 2.2.2b Percentage Distribution of Sampled and Total Women by Five-Year Age Groups Urban Shewa 1984

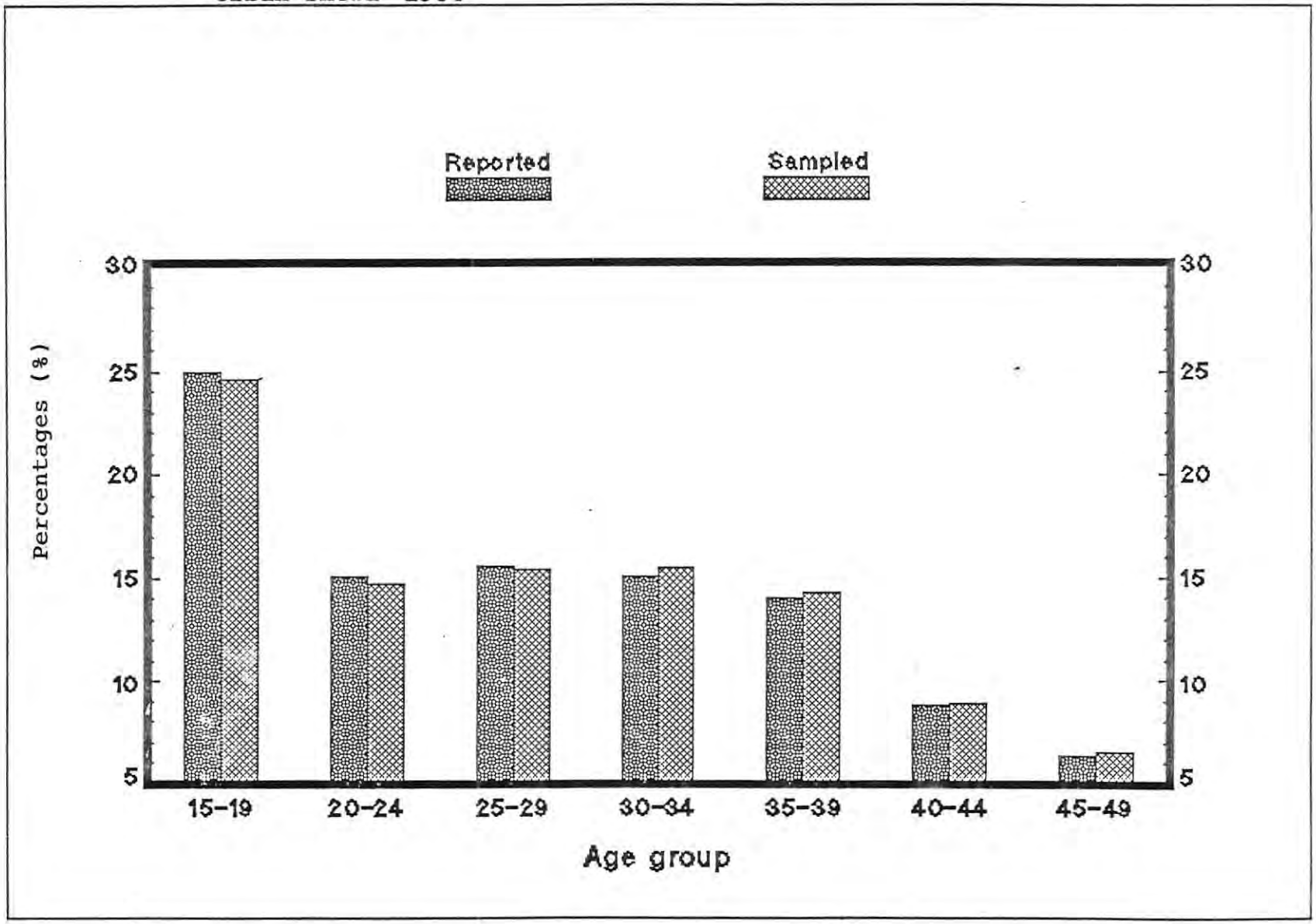
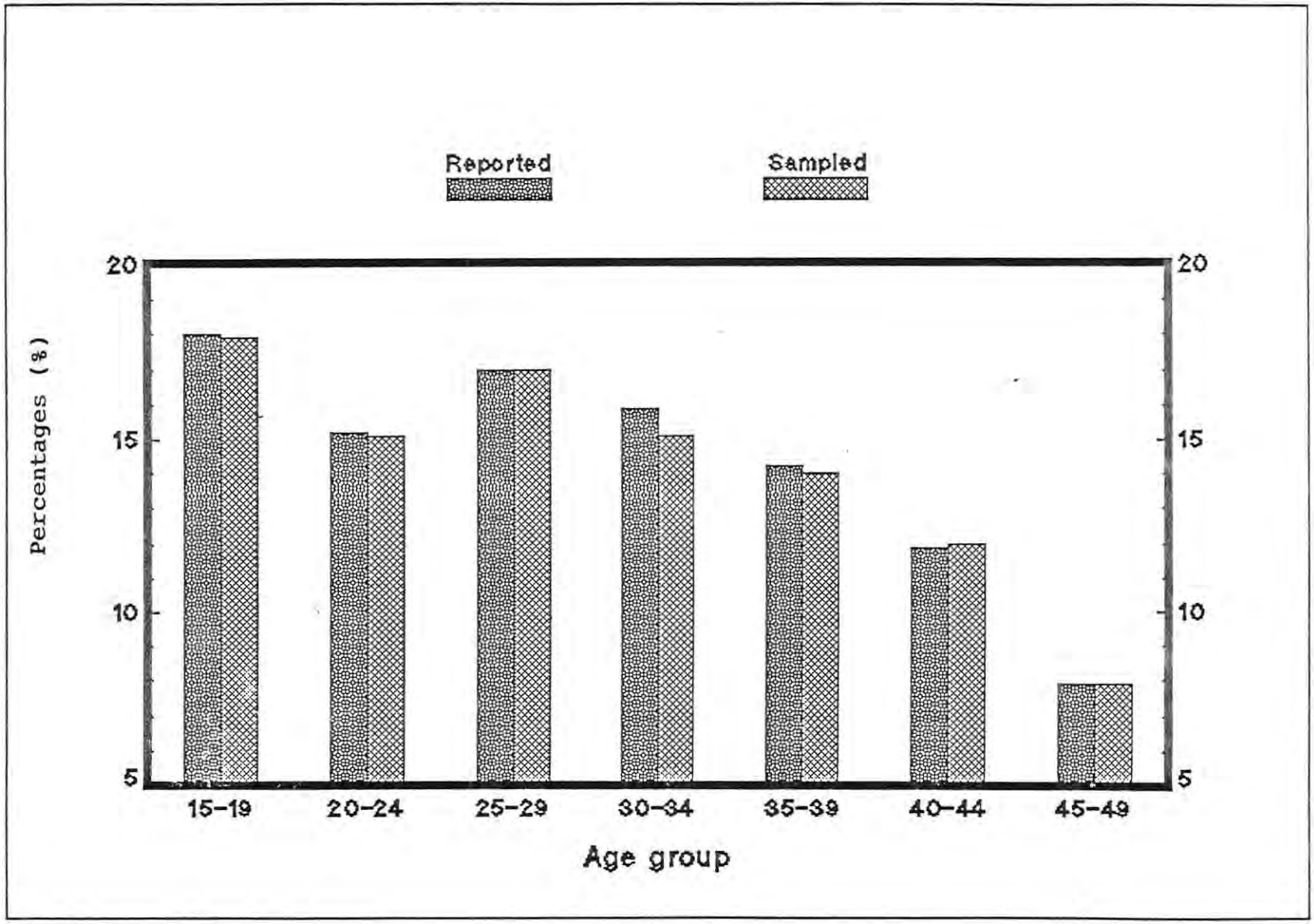


Fig. 2.2.2c Percentage Distribution of Sampled and Total Women by Five-Year Age Groups, Rural Shewa 1984



2.2.3 Education

Data on respondent's education were collected in the Census in two ways. The first one was through school attendance; and the second one was through educational attainment. The latter information is used in this study and the responses are grouped into three categories. These are, the illiterates, those who can read and write only, and those who had completed at least one year of formal schooling. It should, of course, be noted that the formal schooling group includes all women in the primary (1-6 years of schooling) and post primary level of education.

Though desirable for analytical purposes, a further classification of the formal schooling category is not feasible because of the small number of women in the post primary level of education. Table 2.2.3 shows the classification of the women by educational attainment and urban/rural residence. Of the 80528 women, about 84 per cent are illiterate; 4 per cent read and write, and about 12 per cent had some years of formal schooling at the time of the census. There are, however, differences in educational attainment of the women between urban and rural areas. In rural areas, 89 per cent of the women are illiterate, 4 per cent read and write, and about 8 per cent are reported to have formal schooling.

Table 2.2.3

Distribution of Women Aged 15-49 Years by Educational Attainment and Urban/Rural Residence, Shewa 1984

	Total		Urban		Rural	
Education	No	%	No	%	No	%
Illiterate	67358	83.6	3322	40.4	64036	88.6
Read and Write	3269	4.1	583	7.1	2686	3.7
Formal Schooling	9867	12.3	4306	52.4	5561	7.7
Not Stated	34	0.0	9	0.1	25	0.0
Total	80528	100.0	8220	100.0	72308	100.0

The corresponding figures in urban areas are 40.4, 7.1 and 52.4 respectively. The low level of illiteracy rate in urban areas is mainly attributed to the ongoing literacy campaign in the country. As it is true in the other regions of the country, the effect of this campaign is higher in urban than rural areas of Shewa.

2.2.4 Marital Status

Information about respondent's current marital status at the time of the census is collected under the following categories. Never Married, Currently Married, Widowed, Divorced/Separated.

Table 2.2.4 presents the distribution of the women by marital status and urban/rural residence. It is evident from this table that about 1.3 per cent of the women are reported as never married, 78 per cent as currently married, 4 per cent as widowed and 6 per cent as having dissolved marriages at the time of the census.

Table 2.2.4

Percentage Distribution of Women of by Five-Years Age Groups, Marital Status and Urban/Rural Residence, Shewa 1984

Residence Status	Age Group							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
Total	(14940)	(12118)	(13534)	(12812)	(11465)	(9399)	(6260)	(80528)
Never Married	53.5	9.8	2.8	1.8	1.2	1.0	1.0	12.5
Married	41.8	82.1	90.4	89.6	87.4	82.0	76.9	77.6
Widowed	0.2	1.0	1.5	2.8	4.9	9.4	13.2	3.7
Divorced/ Separated	4.5	7.1	5.3	5.8	6.5	7.4	8.9	6.2
Urban	(2023)	(1205)	(1265)	(1273)	(1178)	(733)	(543)	(8220)
Never Married	72.0	20.7	7.4	3.9	2.2	1.4	0.7	23.0
Married	18.7	58.9	73.4	74.9	68.8	60.4	56.8	55.2
Widowed	0.3	1.0	1.8	3.0	5.2	12.4	12.7	3.6
Divorced/ Separated	9.0	19.4	17.4	18.2	3.8	25.8	29.8	18.2
Rural	(12917)	(10913)	(12269)	(11539)	(10287)	(8666)	(5717)	(72308)
Never Married	50.6	8.6	2.3	1.5	1.0	1.2	1.0	11.3
Married	45.4	84.7	92.2	91.3	89.5	83.8	78.8	90.1
Widowed	0.2	1.0	1.4	2.7	4.9	9.1	13.2	3.7
Divorced/ Separated	3.8	5.7	4.1	4.5	4.6	5.9	9.0	4.9

Note: Figures in parenthesis are number of women.

The pattern of marital distribution observed for the region also holds both in urban and rural areas with the exception that proportionately there are more women who are never married and divorced/separated in urban than in rural areas. The proportion of currently married women is higher in rural than in urban areas; the difference in the proportion of widowed women between urban and rural areas is, however, not substantial.

2.2.5 Ethnic and Religious Composition

In the 1984 census, ethnic identity of a person is traced through his/her tribal origin. On this basis, over 28 ethnic groups are identified in the region. In this study, however, only seven major ethnic groups are considered as they are reasonably large in terms of numbers. These groups constituted about 97.0 per cent of the women [see Table 2.2.5]. The other ethnic groups together account for only 2.9 per cent of the women.

Table 2.2.5 shows the distribution of the women by ethnicity and religion. The results show that the Oromos form the largest ethnic group accounting for about 39 per cent of the women. About 24 per cent of the women are reported to belong to the Amara ethnic group. The third largest ethnic group is the Gurage constituting about 16 per cent.

Table 2.2.5

Distribution of Women Aged 15-49 Years, by Ethnicity, Religion and Urban/Rural Residence, Shewa 1984

Ethnic Group	Total		Urban		Rural	
	No.	%	No.	%	No.	%
Alaba	1546	1.9	1	0.0	1545	2.1
Amara	19239	23.9	3962	48.2	15277	21.1
Gurage	12602	15.6	1154	14.0	11448	15.8
Hadiya	6051	7.5	72	0.9	5979	8.3
Kembata	6539	8.1	162	2.0	6377	8.8
Oromo	31076	38.6	1953	23.8	29123	40.3
Welayita	989	1.2	199	2.4	790	1.1
Others	2342	2.9	675	8.2	1667	2.3
Not Stated	144	0.2	42	0.5	102	0.1
Total	80528	99.9	8220	100.0	72308	99.9
Religion						
Orthodox	49345	61.3	6920	84.2	42425	58.7
Protestant	5572	6.9	1194	2.4	5378	7.4
Catholic	1378	1.7	50	0.6	1328	1.8
Muslim	23484	29.2	991	12.1	22493	31.1
Others	666	0.9	48	0.6	618	0.9
Not Stated	83	0.1	17	0.2	66	0.1
Total	80528	100.1	8220	100.1	72308	100.0

Note: Percentages do not add to 100 due to rounding.

In rural areas, the distribution of the women by ethnic groups shows the same pattern as that of the distribution for the entire region. That is, the Oromos constitute the largest proportion (40.3 per cent), followed by the Amaras (21.1 per cent) and the Gurages (15.8 per cent). In urban areas, however, the Amara

women form the single most numerous group, followed by the Oromo women, each accounting for about 48 and 24 per cent of the urban women, respectively. A further look at this table reveals that almost all women who belonged to the Alaba ethnic group are reported to live in rural areas at the time of the census. It should, however, be noted that this ethnic group forms only 2.1 per cent of the rural women.

Regarding religious affiliation of the women the responses are grouped into five categories, namely: Orthodox Christians, Protestants, Catholics, Muslims and others. The "Others" category includes, pagans, Atheists, ... etc. The data in Table 2.2.5 indicate that the majority of the women (about 61 per cent) are Orthodox Christians, 6.9 per cent Protestants, 1.7 per cent Catholics and 29.2 per cent Muslims. The women in the "others" religious group account for only 0.9 per cent of the total women.

The pattern of the distribution of women by religion observed for the total region also holds both in rural and urban areas with the exception that there are more Orthodox Christians in urban than in rural areas. The proportions of Catholic, Protestant and Muslim women are, however, higher in rural than in urban areas.

2.2.6 Economic Activity and Occupation

Data on labor force participation are collected in the 1984 census for all persons aged ten years and over. The approaches adopted for the collection of data on labor force are, nevertheless, different in urban and rural areas. In urban

areas, the current status approach is used. In this approach respondents are asked whether they are engaged in a productive activity[4] for at least one day during the last seven days before the census. In rural areas the usual status approach,i.e., whether respondents are engaged in a productive activity during most of the main agricultural seasons during the previous 12 months preceding the census is utilized.

A respondent is, therefore, classified as active if he/she was engaged in productive activity during the reference period and he/she had a regular job but did not work during the reference period due to poor health, social reasons, seasonality of work, annual leave or due to temporary closure of establishments because of maintenance, or lack of raw materials. Unemployed person (i.e. a person who was not working during the reference period) who was actively looking for work or was a discouraged job seeker was also considered as active. Persons engaged in household duties such as preparing food, cleaning the house, taking care of children, or collecting fire wood without pay were, however, considered as inactive. These persons included students, housewives, disabled, beggars, prostitutes and pensioners [OPHCC, 1989:96].

Based on the foregoing definitions, the distribution of the women under study by activity status is presented in Table 2.2.6a. From this table, it can be observed that about 59 per cent of the women reported to be active at the time of the census. The proportion of active women in rural areas (61.6 per

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[4]Productive activity was defined in the census as work which involves the production of goods or services that can be sold for cash or can be exchanged.

cent) is higher than that of the proportion in urban areas (33.9 per cent). The observed high activity rate in rural areas, could be attributed to the fact that most of the rural women might have been engaged, in one way or the other, in agricultural occupation.

For comparison purposes, the distribution of the total female population aged 15-49 years of the region by labor force participation is also presented in Table 2.2.6a. It is, therefore, clear from the table that the distributions, the sample and total women are almost comparable.

Table 2.2.6a

Distribution of Women (15-49 years) by Activity Status and Urban/Rural Residence, Shewa 1984

	Sample Population						Total Shewa		
	Total		Urban		Rural		Total	Urban	Rural
Activity Status	No	%	No	%	No	%	%	%	%
Active	47353	58.8	2783	33.9	44570	61.6	63.0	37.3	66.2
Inactive	33175	41.2	5437	66.1	27738	38.4	37.0	62.7	33.8
Total	80528	100.0	8220	100.0	72308	100.0	100.0	100.0	100.0

Source: OPHCC, 1989, Tables 3.1, 3.1a and 3.1b

With regard to type of occupation, data are collected only for those persons engaged in productive activities during the reference period, for persons who had previous job experience and for persons who had regular jobs but did not work during the

reference period. Thus, analysis of fertility by occupation is based on a number fewer than the total economically active women.

The census classified the respondents into seven major occupational groups [see OPHCC, 1989]. In this study, however, these occupational classifications are regrouped into two major categories; viz; Agricultural and non-agricultural occupations. The former group consists of women coded by the census as agricultural animal-husbandry and forestry workers, while the latter includes all women coded as professional, technical and related workers, clerical and related workers; administrative, managerial and related workers; sales workers, service workers; and production and related workers. A further split of the non-agricultural occupations is not possible because of the smallness of frequencies in most of the occupational categories identified by the census.

Table 2.2.6b shows the occupational distribution of the economically active women by the two major groups. As can be seen from this table, the majority of the economically active women (about 89 per cent) were engaged in agricultural occupations, while only about 11 per cent belong to the non-agricultural occupations. The same pattern of distribution of active women by occupation is observed in rural areas. That is, about 95 per cent of rural active women were engaged in agricultural occupation, and only about 5 per cent were engaged in non-agricultural occupations. The reverse is, however, the case in urban areas. According to the data on the same table, the non-agricultural occupations form the largest occupational group, engaging about 93 of the urban active women. The

proportion of economically active women engaged in agricultural occupations in urban areas is only 5.2 per cent.

Table 2.2.6b

Distribution of Women aged 15 to 49 years by Occupation and Urban/Rural, Residence, Shewa 1984

	Total		Urban		Rural	
Occupation	No	%	No	%	No	%
Agricultural	42355	89.4	146	5.2	42209	94.7
Non-Agricultural	4954	10.5	2593	93.2	2361	5.3
Not Stated	44	0.1	44	1.6	0	0.0
Total	47353	100.0	2783	100.0	44570	100.0

2.2.7 Migration Status

In the 1984 census, two questions were asked to determine the migration status of a respondent. These are, questions on place of birth and duration of continuous residence. For analytical purposes, data collected using both questions are utilized to fulfill different objectives. Information obtained from the former question is used to determine the status and forms of migration of the sample women. According to place of birth statistics, all women in the sample enumerated in a Wereda or town different from their place of birth were considered as migrants; and all those enumerated at a Wereda or town where they were born were taken as non-migrants. Based on the data from the latter question, all the migrant women are classified by duration

of continuous residence into three categories: less than six years, six to nine years, and 10 or more years.

It should be noted that on the basis of data on continuous residence, all women who continuously resided at the place where they were enumerated since their birth are considered as non-migrants. It should also be noted that the migration considered in this study is both within Shewa and from other regions of the country in to Shewa.

Table 2.2.7a presents the distribution of the women by migration status. It can be seen from this table that about 73 per cent of the women are non-migrants, while about 27 per cent reported to be migrants at the time of the census.

Table 2.2.7a

Distribution of Women of Age 15 to 49 Years by Migration Status and Urban/Rural Residence, Shewa 1984

	Total		Urban		Rural	
Migration Status	No	%	No	%	No	%
Non-Migrant	58381	72.5	1423	17.3	56958	78.8
Migrant	22147	27.5	6797	82.7	15350	21.2
Total	80528	100.0	8220	100.0	72308	100.0

The proportion of migrant women is, however, higher in urban areas (82.7 per cent) than in rural areas (21.2 per cent) indicating that proportionately more women were migrating into urban areas.

Table 2.2.7b

Distribution of Migrant Women (15-49 Years) by Duration of Continuous Residence and Urban/Rural Residence, Shewa 1984

Duration of Migration	Total		Urban		Rural	
	No	%	No	%	No	%
< 6 Years	8332	37.6	2716	40.0	5616	36.6
6 - 9 Years	2631	11.9	1020	15.0	1611	10.5
10+ Years	10918	49.3	2971	43.7	7947	51.8
Not Stated	266	1.2	90	1.3	176	1.1
Total	22147	100.0	6797	100.0	15350	100.0

An examination of data on duration of continuous residence reveals that about 38 per cent of the migrant women stayed at the place of enumeration for less than six years prior to the census night, while 12.0 per cent of them stayed for six to nine years. The proportion of migrant women who reported to be residing continuously in the receiving areas for ten or more years is about 49 per cent. Of 6797 migrant women in urban areas 40.0, 15.0 and 43.7 per cent moved into the region less than six, six to nine years and ten or more years ago prior to the census date, respectively. In rural areas, the distribution of women by duration of continuous residence shows the same pattern as that for the total region and urban areas. About 37, 11 and 52 per cent of migrant women in rural areas moved into their destination less than six, six to nine years and ten or more years before the census.

In order to study the forms of migration (See Glossary for the definition of this term), the distribution of migrant women by form of migration is given in Table 2.2.7c.

Table 2.2.7c

Distribution of Migrant Women aged 15-49 Years by Forms of Migration, Shewa 1984

	Forms of Migration				
	Rural-Rural	Rural-Urban	Urban-Urban	Urban-Rural	All Forms
Number	15052	4849	1948	298	22147
Per Cent	68.0	21.9	8.8	1.3	100.0

As could be evident from the data in this table, the major form of migration (68 per cent) is rural to rural migration. Such a phenomenon is not unexpected in view of the agrarian nature of the economy of the region. The second dominant form of migration is the rural-to-urban, which has a share of about 22 per cent. The third important form of migration in the region is urban-to-urban, which constituted about 8.8 per cent of the total migrants, while the urban-to-rural is the least important form of migration accounting only for 1.3 per cent of the migrants.

2.3 Evaluation of Age and Fertility Data

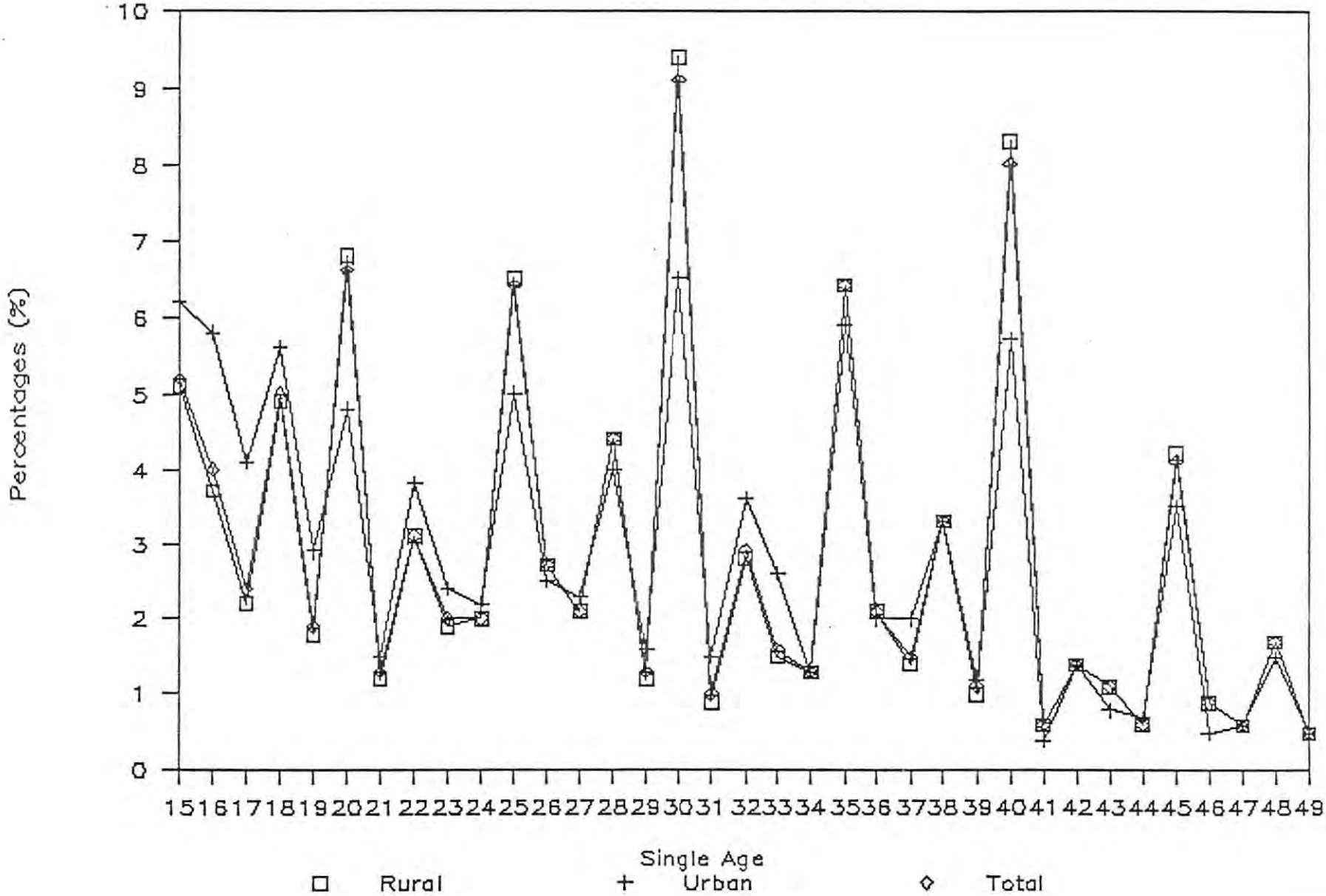
It is well known that in censuses, which involve various interrelated steps and stages, and human and mechanical factors, it is possible that errors, biases, and deficiencies creep in.

Since errors and biases may create significant distortions in the results of any demographic analysis, it is essential to evaluate or appraise the quality of data and check whether the data produced are of sufficient accuracy for utilization for analytical purposes. In view of this, evaluation of the data used to determine the levels and differentials of fertility is undertaken. The types of data that are evaluated include age of women, current and retrospective fertility and the classification of zero parity women as parity not stated.

2.3.1 Evaluation of Age Data

In the absence of drastic reduction in mortality and mass migration of population, and given that the age is accurately reported, the expected age distribution is one which has a descending pattern as age advances. The data for the present study, however, deviate from this general trend as marked heaping at ages ending in zero and five is clearly seen from Figure 2.3.1. The heaping is also observed, though to a lesser extent, at ages ending in even numbers. The most preferred digits among the women aged 30 and above are digits ending in "0" and "5", while below age 30, the highly preferred digits are "0", "5" and "8". The peaks observed at any age are at the expense of under-reporting in the adjacent ages. For example, the peak at ages ending in "0" is at the expenses of under-reporting of ages ending in "9" and "1".

Fig. 2.3.1 Percentage Distribution of Sampled Women by Single Years of Age and Urban/Rural Residence, Shewa 1984



It is also evident from Figure 2.3.1 that the degree of age heaping at ages ending in "0" and "5" is relatively less for the women beyond age 20 in urban than in rural areas. For women below age 20, it however, seems that the age reporting is relatively better in rural than in urban areas. It is, therefore, decided to group the data into 5 years age groups, as mis-reporting and/or heaping would be much reduced in the latter compared to the figures for the former [Shryock et. al, 1976:115].

2.3.2 Evaluation of Reported Fertility Data

Data on retrospective fertility can be affected by errors in the reported number of children ever-born alive. This is mainly due to recall-lapse. Women in the older age groups tend to forget births that ended in early deaths, children grown up and living elsewhere, children born to another husband, and children not present at home for various reasons. The reported number of children ever born, on the other hand, may be inflated by the inclusion of step or adopted children, grand children etc. Another serious error is the parity not-stated group. It is, therefore, very important to appraise the reported fertility data before doing the analysis.

Information on fertility can be evaluated by examining the mean number of children ever born by five-year age groups of women. Under normal circumstances, it is expected that average parities should increase as age of women increases. To examine the prevalence of deviations from this pattern, average parities by

five years age groups of women for urban and rural areas are computed and presented in Table 2.3.2a. It is observed from this table that the average parities increase all the way as the age of the women advances. This, therefore, shows no clear evidence of omission or under-reporting of children ever-born.

A similar pattern is also observed in rural areas. In urban areas, however, average parities rise smoothly up to age 40-44 and declines thereafter. This decline of parity as age increases, which might be attributed, among other things, to recall lapse, suggests that children have been omitted for older women to some extent.

Table 2.3.2a

Mean Number of Children Ever-Born by Five Years Age Groups of Women and Urban/Rural residence, Shewa 1984

Age Group	Total	Urban	Rural
15-19	0.335	0.210	0.335
20-24	1.598	1.291	1.633
25-29	2.750	2.340	2.794
30-34	3.748	3.309	3.799
35-39	4.505	3.931	4.574
40-44	4.758	4.029	4.822
45-49	4.787	3.994	4.866
Total	2.929	2.300	3.004

The internal consistency of data on children ever born can also be assessed by examining the sex ratios of children ever-born. Accordingly, the sex ratios of children ever born to women in the

sample for both urban and rural areas are calculated and presented in Table 2.3.2b.

Under normal circumstances, the sex ratios at birth for African population are expected to be between 102 and 107 [UN, 1983:26-71]. Sex ratios significantly higher than 107 or lower than 102 indicate the existence of differential omission of females or males, or mis-reporting of the sex of the reported children. As can be seen from Table 2.3.2b, the overall sex ratios are 110.5, 110.8 and 106.3 for the region, rural and urban areas, respectively. It may, therefore, be said that female under-reporting is relatively high in rural than urban areas.

Table 2.3.2b

Sex ratios of Children Ever Born by Five-Year Age Group of Women and Urban/Rural Residence, Shewa 1984

Age Group	Total	Urban	Rural
15-19	104.3	102.4	104.5
20-24	108.7	107.2	108.9
25-29	108.8	107.3	108.9
30-34	111.0	108.1	111.3
35-39	108.7	103.9	109.2
40-44	112.1	102.6	112.9
45-49	114.5	112.3	114.6
Total	110.5	106.3	110.8

Considering the sex ratios by age group of women, it is observed that there is under-reporting of females to certain degree in all

age groups except 15-19. This is also true for rural areas. In urban areas, relatively high sex ratios are observed in the age groups 30-34 and 45-49, the sex ratios in the remaining age groups are, nevertheless, within the expected range.

In general, the sex ratios of children ever -born alive for women aged 20 and over are high indicating that women in these age groups might have missed their live born female children who are either living elsewhere at the time of the census or who have died a long time ago.

Another powerful method of testing inconsistencies in the reported fertility data is to compare average parity, P(i), with estimated parity equivalent, up to age x, F(x), which is derived from births in last year preceding the census using the Brass P/F ratio method with the usual assumption of constant fertility in the recent past.

Ideally, average parity equivalent should be equal to the lifetime fertility [Brass, 1975]. Any deviation of the P/F ratio value from unity at the respective age groups indicates whether there has been an over or under estimation of fertility due to mis-understanding of the reference period during which reported births had occurred, or due to omission of children ever born who live else where or those who died earlier. If the P/F ratios are under unity, it may be said that births which occurred during a longer period than the 12 months reference period are included and hence over estimation of the current fertility level [Brass, 1975]. It may also be said that the retrospective fertility is under reported.

Assuming that fertility has remained constant in the recent past, P/F ratios for the total and rural areas of the region are calculated and presented in Table 2.3.2c.

The data in this table show a declining trend in P/F ratios with increasing age for total women and for those in rural areas. The values are much higher than unity for women in the age groups 15-24 and much lower for those women above age 40, indicating the presence of errors in both retrospective and current fertility data. For the remaining age groups, the ratios range between 0.943 to 1.120. It is often argued that values of P/F ratio between 1 and 1.2 for the age range 20-35 are indications of reasonably good data in Africa [UN, 1986; cited in G/Mariam, 1984:117]. In light of this, it may be concluded that the data on both retrospective and current fertility, are relatively well reported, particularly for the women in the age range 25-29.

Table 2.3.2c

P/F Ratios by Five Years Age Groups of Women, Shewa 1984

Age Group	Rural	Total
15-19	1.686	1.720
20-24	1.351	1.392
25-29	1.092	1.120
30-34	0.996	1.020
35-39	0.992	0.943
40-44	0.851	0.872
45-49	0.774	0.790

Besides the foregoing techniques, the quality of reported fertility data can be examined by checking the consistencies of the proportion of children dead. It is commonly argued that, if the data are correctly reported, the proportion of dead children shows an increasing trend by age of women [UN, 1983]. This is mainly, because of the fact that the relative magnitude of omission of children ever born alive would be higher for children who had died, particularly for those who died at younger ages compared to those who survive. In order to study this trend, the proportions of dead children by age group and for urban and rural areas are computed and shown in Table 2.3.2d.

Table 2.3.2d

Proportion of Children Dead by Five-Year Age Group of Women and Urban/Rural Residence, Shewa 1984

Age Group	Total	Urban	Rural
15-19	0.1323	0.1064	0.1348
20-24	0.1504	0.1189	0.1533
25-29	0.1553	0.1402	0.1567
30-34	0.1700	0.1517	0.1718
35-39	0.1795	0.1734	0.1801
40-44	0.2019	0.2087	0.2014
45-49	0.2268	0.2406	0.2257
Total	0.1806	0.1706	0.1815

The results on this table do not show any clear under -reporting of dead children by neither younger nor older women, because the proportion of dead children increases gradually as women become older. This trend is consistent for all women aged 15 to 49 and in both urban and rural areas.

To sum up, the foregoing analysis of testing the relative accuracy of the reported fertility data, on the whole, does not reveal any substantial omission or under-reporting of children ever born and births in last year preceding the census for both rural and urban areas. However, the fact that the average parities are lower than what is normally expected for a region of a country like Ethiopia, which is characterized by high level of fertility, and the sex ratios of children ever-born are high and erratic indicate the existence of omission and/or mis-reporting of children ever born alive. This may be attributed to the memory lapse of the women, particularly women in older age groups.

The calculated values of P/F ratio also show some inconsistencies in both current and life time fertility. Data on current fertility, i.e births during the last 12 months are liable not only of mis-understanding, but also mis-interpretation of the 12 months reference period. And estimation of any measure of fertility from these data sets might underestimate the level of fertility in the region. Thus, in order to determine the fertility level in the region the reported fertility data is adjusted. The findings on the analysis of fertility differentials, which are mainly based on children ever-born should, however, be treated with caution.

2.3.3 Evaluation and Adjustment of the Zero Error

Information on the number of children ever-born to a sizeable proportion of women (19.8 per cent) in the sample are either not forthcoming or are not noted down, so that in the tabulations all these women are put as "parity not stated". The majority of parity not stated women (about 44 per cent) are from the age group 15-19 and most of them might be of zero parity. If we exclude these women, the average parities of the remaining women would go up. If, on the other hand, we include all of them in the zero parity group, then the average parities would tend to be reduced, because there might be a few women who might have a child or more, but failed to report it or get it recorded. In other words, the existence of such an error is likely to affect the level of fertility and hence the need for adjustment of this error.

El-Badry [UN, 1983] proposed a simple technique to estimate the proportion of women belonging to the parity not-stated category who should have been classified as zero parity (childless). His method is based on fitting a linear equation:

$$NS(i) = \alpha Z^*(i) + \beta$$

where NS(i) is the observed proportion of women in the parity not stated category in age group i, $Z^*(i)$ is the true proportion of childless women in the same age group, α is the proportion who are truly childless and who are erroneously classified as "parity not stated", and β is the constant, true

level of non-stated. Using Z(i), the reported proportion of childless women in the age group i, the above equation reduces to :

$$NS(i) = \delta Z(i) + \beta \qquad \text{where} \quad \delta = \alpha/(1-\alpha)$$

The method assumes that the relationship between NS(i) and Z*(i) is linear and should be non-negative.

In the present study it is noticed that the above assumptions are fulfilled and hence the method is applied for both urban and rural areas (see Appendix I). The parameters δ and β are estimated applying a group mean method. The estimated values of δ and β for rural areas are 1.35295 and 0.72090, respectively; while the corresponding estimates for urban areas are 0.04582 and 0.00491.

It should be, of course, noted that the adjustment made in this regard is only to estimate the level of fertility for the total region and also for rural and urban areas. To investigate fertility differentials among the different socio-economic groups, however, it is decided to exclude all women in the parity not-stated category from the analysis. This is mainly because of the fact that, though the percentages of the unknowns are substantially high, the variations in the incidence of the non-response among the identified groups are not much. Indeed, certain specific groups have slightly higher incidence of the error. For example, urban women had slightly higher error than their counterparts in rural areas; women who have formal

schooling had less error than those who read and write and also than the illiterates.

To see the effect of this error, some of the analysis on fertility differentials have been carried out three times, after including, excluding and adjusting the parity not stated group. The findings are not, however, materially different. Thus, as the three modes of analyses are not very much different from each other, it is decided to do the analysis on fertility differentials in this study based on only the women who reported their parity.

CHAPTER III

LEVEL OF FERTILITY IN SHEWA

3.1 Introduction

In this chapter, an attempt is made to determine the level of fertility in the entire Shewa as well as in its urban and rural areas. The indices of fertility[1] thus considered are crude birth rate (CBR), general fertility rate (GFR), total fertility rate (TFR), gross reproduction rate (GRR) and average parity for women aged 45-49 years. However, as discussed in the preceding chapter, the fertility data suffer from omission and/or under-reporting of births. This suggests that the reported fertility rates might possibly be grossly under estimated and hence may not be accepted as the true level of fertility in the region. Therefore, estimation of the indices is carried out using indirect estimation techniques.

It should be noted that estimation of all the reported and adjusted fertility rates is based on the number of women with known parity estimated by El-Badry method. The distribution of these women by five year age groups and urban-rural areas is given in Appendix I.

This chapter has four sections. In section two, the reported fertility level is examined and new fertility rates are indirectly estimated. Section three attempts to appraise the estimated fertility rates, select the fertility level for the region and discuses the possible factors that explain the level

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[1]See Glossary for the definitions of the indices.

thus selected. Finally, in section four, a summary of the main findings of the chapter are presented.

3.2 Level of Fertility in Shewa

3.2.1 Reported Fertility Level

The level of fertility in Shewa, expressed in terms of Crude Birth Rate (CBR), General Fertility Rate (GFR), Total Fertility Rate (TFR), Gross Reproduction Rate (GRR), and average parity for women aged 45-49 years (i.e completed fertility), are presented in Tables 3.2.1a - 3.2.1C. As can be seen from Table 3.2.1a, the reported CBR for the region as a whole is 35.3 per thousand population. The corresponding figures in urban and rural areas are 25.6 and 36.4, respectively.

Table 3.2.1a

Reported Crude Birth Rate by Urban and Rural Areas, Shewa 1984.

Residence	Population[2]	No. of Births	CBR
Total	401177	14172	35.3
Urban	38742	993	25.6
Rural	362435	13179	36.4

Source: Computed by the author from the sample.

[2] The population is estimated as 5 per cent of the total population of the region.

As shown in Table 3.2.1b, the GFR in the entire Shewa is 183.6 per thousand women (15-49 years); while the corresponding figure in urban and rural areas are, respectively 121.4 and 191.0. The TFR indicates a similar pattern with 6.15 in Shewa, 4.20 in urban areas and 6.37 in rural areas. Similarly, the GRR is 3.01, 2.06 and 3.10 in total, urban and rural areas of the region, respectively.

Table 3.2.1b

Reported General Fertility, Total Fertility and Gross Reproduction Rates by Urban/Rural Residence, Shewa 1984.

Residence	No.of Women (15-49)	No. of Births	GFR	TFR	GRR[3]
Total	77174	14172	183.6	6.15	3.01
Urban	8179	993	121.4	4.20	2.06
Rural	68995	13179	191.0	6.37	3.10

Source: Computed by the author from the sample.

[3] GRR=TFR x 1/SR, Where SR=Sex Ratio at Birth.
Based on the records of birth events in hospitals in A.A and experimental vital registration in rural areas, the sex ratio at birth was observed to be between 104-105 (Abdulahi 1989:103). Thus, for the purpose of this study the SR is taken as 104 males per 100 females.

The mean number of children ever-born per woman at the end of their reproductive period (45-49 years) is 4.79 in total 3.99 in Urban and 4.87 in rural Shewa (See Table 3.2.1c).

Table 3.2.1c

Reported Mean Number of Children Ever-Born Alive (parity) For Women at the Age Group 45-49, by Rural/Urban Residence, Shewa 1984.

Residence	No. of Women (45-49)	No. of CEB	Average Parity
Total	5995	28700	4.79
Urban	540	2157	3.99
Rural	5455	26543	4.87

Source: Computed from the sample.

In all the reported fertility measures, the rates in urban areas are lower than the rates recorded in rural areas, while the rates for the entire Shewa fall in between.

However, in view of the conditions that are likely to favor high fertility patterns in the region, the reported fertility rates appear to be under-estimated. Moreover, comparison of the rates from the sample with that of the total population indicate that the former are lower than the latter in the entire Shewa, as well as in both urban and rural areas of the region (see Table 3.2.1d). This situation might have resulted mostly from omission

and/or under-reporting of births. As is well known, the omission/under-reporting of birth is not uncommon in a situation where in fact deaths are grossly under-reported. And if the births are under-reported and not accounted for, the fertility rates thus obtained will be grossly under-estimated. This, therefore, calls for indirectly estimating the level of fertility using an appropriate technique which takes in to account for under-reporting of births.

Table 3.2.1d

Measures of Fertility Based on Reported Data From the Total Population, Shewa 1984.

Residence	CBR	GFR	TFR	GRR	Average Parity (45-49)
Total	38.2	188	6.3	3.1	5.3
Urban	31.4	136	4.7	2.4	4.6
Rural	39.0	194	6.3	3.2	5.4

Source: OPHCC (1989). Table 4.1.1

3.2.2 Estimated Level of Fertility

As discussed earlier, the fertility data are subject to under-enumeration of children ever-born. As a result, the reported

fertility rates thus obtained are under-estimated. In this section therefore, an attempt is made to adjust the measures of fertility using indirect estimation techniques.

The methods employed for estimation of fertility rates in this section are selected on the basis of the type and nature of data available. The selected indirect estimation techniques are: the Brass P/F ratio technique and the Relational Gompertz model.

3.2.2.1 Estimation of fertility Using the P/F Ratio Method

The P/F ratio method, which was first proposed by Brass and latter modified by Coale and Trussell [UN, 1983:3], has been used not only for detecting errors in fertility data but also for adjusting the data distorted by typical errors like omission or mis-perception of the length of the reference period in the case of the information on current fertility.

The P/F ratio method assumes that fertility has remained constant in the recent past, that the pattern, though not the level of the age specific fertility rate is correct, and that the level of retrospective fertility for the younger women provided by the children ever-born data are more or less accurate [UN, 1983:33-35]. If the above assumptions hold true, the cumulated current fertility up to age x or average parity equivalent, F(x), should be equal to the life-time fertility (parity) at age x, P(x). If there is any difference between the two, it may be attributed to the errors that are normally present in data on children ever born and current births. Hence, the need for adjusting the current fertility using some adjustment factors.

The ratios P(x)/F(x) for the younger women particularly those in 20-24 and 25-29 age groups (i.e P_2/F_2 and P_3/F_3) are usually recommended to be applied to the recorded fertility rates as adjustment factors on the assumption that births reported by younger women are more reliable. This assumption may not, however, be valid in some situations. To overcome this problem, therefore, it is recommended to derive an adjustment factor by means of various combinations of ratios like $1/2(P_2/F_2 + P_3/F_3)$, or $1/3\ (P_2/F_2 + P_3/F_3 + P_4/F_4)$ or weighted average of P/F values with the number of women as weights in the respective ages [UNECA, 1988:198].

Assuming that all the assumptions are valid in total and rural areas of the region, the P/F ratio method of estimating fertility is employed. In urban areas, however, because of situations of changing fertility, this method can not be applied and hence, the relational Gompertz model, for which the assumption of constant fertility is relaxed, is used.

The new fertility rates estimated on the basis of the modified version of the Brass P/F ratio method, i.e. the Coale and Trussell method, for rural and total Shewa are presented in Table 3.2.2. Because of the erratic nature of the P/F ratios, the weighted average of P_2/F_2 and P_3/F_3, the weights being the number of women in the respective age groups, are selected as adjustment factors for total Shewa as well as for the rural areas of the region.

As can be seen from the table, the adjusted age pattern of fertility in the region as well as in rural areas follow the pattern which is more typical of a society with high fertility in

early ages like many African countries. That is, there is a small decline in ASFRs at ages of above 30 years; a sharp increase in ASFRs at ages below 30 years and the peak is observed at the age group 25-29. It can also be observed that the contribution of the women below age 30 to the TFR is about 50 per cent in the total Shewa and also in rural areas.

Table 3.2.2

Reported and Adjusted ASFRs Using the P/F Ratio Method, Shewa 1984

Age Group	Index i	Total		Rural	
		Reported	Adjusted	Reported	Adjusted
15-19	1	0.0890	0.1318	0.0957	0.1375
20-24	2	0.2416	0.3129	0.2505	0.3149
25-29	3	0.2633	0.3285	0.2712	0.3292
30-34	4	0.2338	0.2888	0.2415	0.2904
35-39	5	0.2070	0.2521	0.2150	0.2547
40-44	6	0.1210	0.1358	0.1252	0.1368
45-49	7	0.0737	0.0846	0.0755	0.0841
Total		1.2295	1.5345	1.2746	1.5477
	TFR	6.15	7.67	6.37	7.74
	GRR	3.01	3.76	3.12	3.79
	GFR	183.6	231.0	191.0	233.6
	CBR	35.3	44.4	36.4	44.5

Based on these ASFRs, the adjusted TFR for Shewa is found to be 7.67 children per woman. The corresponding figure for rural Shewa is 7.74. Assuming sex ratio of 104 males per 100 females, the rates yielded GRRs of 3.76 and 3.79 daughters per woman for total Shewa and rural areas, respectively. The adjusted CBR and

GFR of the region are 44.4 children per 1000 population and 231.0 children per 1000 women, respectively. In the rural areas these figures are 44.5 and 233.6, respectively. In sum , all the fertility rates estimated by the P/F ratio method suggested appreciably high levels of fertility in the region as well as in rural areas.

3.2.2.2 Estimation of Fertility Using The Relational Gompertz Model

In order to validate the fertility rates estimated by the P/F ratio method, the Relational Gompertz Model of fertility estimation is also employed in this study. The Relational Gompertz Model has been proposed to adjust and correct fertility distributions derived from fertility data on children ever-born and current births [Zaba, 1981: Brass, 1981]. Unlike the P/F ratio method, the Relational Gompertz Model does not require the assumption of constant fertility in the past or the assumption of errors being constant for all ages except for those ages in which the model is fitted. The basic rational of the model is that the proportion of TFR experienced up to age x, (i.e. cumulative fertility up to age x) follows a Gompertz distribution function, whose equation is of the form:

$$F(x)/TF=A^{\beta^{X}} \quad [1]$$

where F(x) is the cumulated ASFRs (or parity) up to age x, TF is total fertility rate, A and B are constants for a particular set of rates and lie between 0 and 1.

As it has been argued by Brass [1981], it is more convenient to work with the linear expression of the model by taking the natural logarithms of each side of equation [1] twice. Accordingly, [1] has the form of:

$$Y(x) = a+bx \quad \ldots\ldots\ldots \quad [2]$$

where $Y(x) = -\ln [-\ln(F(x)/TF)]$, and a and b are constants derived from A and B. In order to improve the fit of the above model at the extreme ages, it is further argued, more efficient methods can be devised by transforming the age scale. In the transformed system, values of Y(x) are linearly related to a standard set of rates. If $Y_s(x)$ denotes the standard values, then equation [2] reduces to:

$$Y(x) = \alpha + \beta\, Y_s(x) \quad \ldots\ldots \quad [3]$$

where α and β are constants that reflect the pattern of fertility of a particular population.

It is, however, important to note that the actual fitting of equation [3] can only be done when the value of TF is known, which indeed is to be estimated. To circumvent this problem, therefore, Brass [1981] suggested an alternative fitting procedure using Z(x), instead of Y(x). The values of Z are obtained from:

$$Z(x) = -\ln[-\ln(F(x)/F(x+5)] \quad \ldots\ldots\ldots [4]$$

where x = 20, 25,..., 50 refers to age of women. The estimates of α and β are then found by fitting approximately equivalent expression:

$$Z(x) - e(x) = \alpha + \beta\, g(x) \quad \ldots\ldots\ldots [5]$$

and applying the least squares method for the first four or five points. Values of e(x), and g(x), computed from the standard distribution, are given in Brass [1981].

The relational Gompertz model has been applied to fertility data for Ethiopia and other African countries and found to give plausible results [Abdulahi, 1989:31; Assefa, 1990:194]. The model has been therefore, applied to the reported fertility data for Shewa region. It is fitted to the current fertility data for the ages 20, 25, 30, 35 and 40, and the estimates of the parameters α and β are obtained by using the least squares method. It is observed that in all cases the fit is good, i.e, r is higher than 0.99. The estimated values of α for the entire Shewa, for rural and urban areas are -0.222, -0.260 and -0.213, respectively; while those for β are 0.921, 0.986 and 0.960 for total, urban and rural areas of Shewa, respectively.

Table 3.2.3 presents the indices of fertility derived through the Gompertz model. As can be seen from this table, the estimates of fertility rates based on this method are comparable with the corresponding rates derived through the P/F ratio method. Indeed, the Gompertz model has slightly decreased the

fertility rates of the total Shewa, while the rates for rural areas based on the two different methods almost coincide.

The Gompertz model gives TFRs of 7.36, 7.74 and 6.50 children per woman for the total Shewa, rural and urban areas of the region, respectively. Using sex ratio at birth of 104 males per 100 females, the GRRs for Shewa, rural and urban areas are 3.61, 3.79 and 3.19 daughters per woman, respectively. The estimates of fertility using this method also show rural/urban differentials in the level of fertility but the difference is less than two children per woman.

The estimates of CBR are 41.8, 43.7 and 38.7 children per 1000 population for the entire Shewa, rural and urban areas of the region respectively, while the GFRs are estimated to be 217.2, 229.7 and 183.4 children per 1000 women, respectively.

The observed small differences in the estimates of fertility derived from the two methods, i.e the P/F ratio and the Gompertz model, in total Shewa might be attributed to the distortions of the data to which the methods are sensitive. The strikingly identical results in rural areas based on the two methods suggest that the distortion of the data is less in rural than total areas.

To conclude, it may be said that, inspite of the observed differences, the fertility rates obtained by the relational Gompertz model could also be considered as reasonable as those derived from the P/F ratio method. The implied levels of fertility for the region and also for both urban and rural areas were quite high in 1984.

Table 3.2.3

Adjusted Fertility Rates Using the Relational Gompertz Model, Shewa 1984

Age Group	Index	Age specific Fertility Rate		
		Total	Rural	Urban
15-19	1	0.0506	0.0558	0.0304
20-24	2	0.2196	0.2335	0.1847
25-29	3	0.3272	0.3430	0.3055
30-34	4	0.3207	0.3349	0.3021
35-39	5	0.2789	0.2914	0.2534
40-44	6	0.1977	0.2075	0.1670
45-49	7	0.0767	0.0824	0.0576
Total		1.4714	1.5458	1.3007
TFR		7.36	7.74	6.50
GRR		3.61	3.79	3.19
GFR		217.2	229.7	183.4
CBR		41.8	43.7	38.7

3.3 Appraisal of the New Fertility Estimates and Selection of Fertility Levels

The estimates of fertility obtained using both the Coale and Trussell and Relational Gompertz methods together with the reported rates are given in Table 3.3.1. It is observed from the table that both methods have raised the reported fertility measures.

Assuming that fertility has remained constant in the past, the fertility rates obtained by the P/F ratio method suggest that the

level of fertility in Shewa is quite high in 1984. According to these estimates, women in total and rural Shewa bear, on the average, more than 7 children before the end of their reproductive period (i.e 45-49 years). The estimated total fertility rate for rural areas closely corresponds to the estimate based on the 1981 Rural Demographic Sample Survey which was about 7.7 children per woman [CSA, 1988].

Table 3.3.1

Reported and Estimated Fertility Rates, Shewa 1984

Fertility	Total				Rural				Urban			
Measures	CBR	GFR	TFR	GRR	CBR	GFR	TFR	GRR	CBR	GFR	TFR	GRR
1. Reported	35.3	183.6	6.15	3.01	36.4	191.0	6.37	3.10	25.6	121.4	4.20	2.06
2. Estimated												
a. P/F	44.4	231	7.67	3.76	44.5	233.6	7.74	3.79				
b. Gompertz	41.8	217.2	7.36	3.61	43.7	229.7	7.74	3.79	38.7	183.4	6.50	3.19

Moreover, comparison between the new CBR estimates using the P/F ration method and that of the CSA are almost identical. According to the Census results for Shewa, the CBR for the region was 44.2 births per 1000 population in 1984. It may, therefore, be concluded that all the estimated fertility indices for the entire Shewa as well as for the rural areas could be considered as plausible and the levels implied by these indices are acceptable. Similarly, the estimates based on the relational Gompertz model can be considered as reasonable as they are comparable with the corresponding rates by the P/F ratio method. In fact, the Gompertz model has an advantage over the P/F ratio method, as it does not require the assumption of constant fertility in the

past. The model is, therefore, expected to yield plausible results for areas where there is a situation of changing fertility, as one would expect in urban areas of African countries. It is observed that for countries or regions within countries with TFR of 7 children or more in rural areas, the TFR for urban areas is usually between 5.75 to 6.76; and the difference between rural and urban TFR is less than 2 children per woman [see UN, 1987:193]. The estimates of TFR based on the relational Gompertz model lend support to these findings. According to the estimates by this model, women in urban and rural Shewa bear, on the average, more than 6 and 7 children, respectively before they get to menopause.

Moreover, except for urban areas, the fertility estimates by the CSA, obtained through the P/F method, are in close agreement with the corresponding new estimates by the Gompertz model. The CSA estimated a TFR of 7.24 for urban areas of the region [OPHCC, 1989:133]. The apparent differences in the new estimates and those by the CSA for urban areas might be due to the distortion of the data in which the P/F ratio method is sensitive. In general, like the fertility measures derived by the P/F method, the estimated fertility rates using the Gompertz model are reasonable and suggest that the levels of fertility in the region, as well as in its rural and urban areas are considerably high.

At the outset, it should be noted that, although both techniques give comparable figures, there are still some differences in the estimated fertility indices. Since both techniques have their own merits and demerits, it was difficult

to choose the most appropriate and reliable one and thereby to select the most plausible estimates of fertility level. In view of this, it would, therefore, be better to use ranges (lower and upper limits of fertility measures obtained by the two methods) of estimates presented in Table 3.3.1, at least for entire Shewa and rural areas. Hence, for the entire Shewa the level of fertility ranges from a CBR of 41.8 to 44.4; a GFR of 217.2 to 231.0; a TFR of 7.36 to 7.67; and a GRR of 3.61 to 3.76. In the rural areas of the region, the level ranges from a CBR of 43.7 to 44.5, a GFR of 229.7 to 233.6 a TFR of 7.74 and a GRR of 3.79. In the urban areas, on the other hand, the fertility rates obtained by the Gompertz model could be considered as plausible.

3.4 Summary And Discussion

The foregoing analysis reveals that the reported fertility rates are under-estimated and hence could not be accepted as the true level of fertility in the region. The estimated fertility rates through the application of the P/F ratio method and the relational Gompertz model, on the other hand, appear to be plausible. Although the estimates by these two methods show some slight differences, they all suggest that the levels of fertility in the entire Shewa as well as in both urban and rural areas of the region are genuinely high. They, however, show that fertility is higher in rural than urban areas.

The high level of fertility prevalent in the region might be attributed, among other things, to customs and beliefs favoring high fertility, universal and early marriages, low status of

women, high infant and child mortality, relatively low level of infertility and absence of any deliberate birth control methods.

In Ethiopia, as elsewhere in the developing world, traditional beliefs and customs which favor high fertility pattern are apparent. As argued by Assefa [1990:209], "... having many children is considered as a virtue and to have children is a desire of righteousness." Having many children is also considered as getting respect and better social status in the community. Moreover, since children play important roles in the economy of households and since cost of bearing and rearing children is very low in the country, specially in the rural areas, people have the tendency of having as many children as they can.

Marriage is universal and starts early in the country. Since most births in the society take place within marriages, such phenomena have a clear and positive effect upon fertility. Data for this study, for instance, show that about 90, 79 and 91 per cent of total, urban and rural women in the age group 20-24 are reported as ever married at the time of the census. The corresponding figures for the age group 25-29 are 97.2, 96.1 and 98.5, respectively. This, therefore, implies the universality of marriage in the study areas.

Although it is not possible to compute the age at first marriage for the population under study, data from other sources indicate that marriage starts very early in this part of the country. According to the Census results [OPHCC, 1989:41], for example, the singulate mean age at marriage for females in this region was 18 years. Assefa [1990:210], also found a median age

at first marriage of 16 years in 1986 for Arssi and Shewa regions. In non-contracepting society like ours, early marriage means a longer duration of exposure to the risk of childbearing and hence results in high fertility.

The persistently high level of infant and child mortality in the region might also explain the observed high level of fertility. The 1984 Census results for the region revealed that infant/child mortality is considerably high. According to the estimates by the CSA [OPHCC, 1989:149], the infant mortality rate in 1984 is 111 per 1000 live births in the region. The rate was higher in rural than in urban areas, which were 111 and 101 per thousand live births, respectively. This high infant/child mortality, as discussed earlier, has an obvious positive effect on fertility.

The other possible explanation for the observed high level of fertility in the region is the absence of birth control methods. As noted by Assefa [1990:216-217], the prevalence of knowledge and use of contraceptive in the country is negligible; and prolonged abstinence is not widely practiced. In an attempt to see the extent of fertility control in the study area, the index of fertility regulation, m, is estimated using the method suggested by Coale and Trussell [1978:202-213] (See Appendix III, for the description of the method). As argued by Coale and Trussell, values of m less than 0.2 are assumed to represent natural fertility condition; a value of m = 0 corresponds to the level of natural fertility attained by the Hutteriets [Henry, 1961, Cited in UN, 1983:24].

The estimated values of m for the total Shewa, rural and urban areas are -0.122, -0.132 and 0.0301, respectively. The figures clearly show that the region as a whole exhibited a fertility schedule which is very close to the natural fertility pattern identified by Henry [1961 Cited in UN, 1983], and also suggest that there is no practice of fertility control both in rural as well as in urban areas of the region.

Finally, as indicated earlier, the high level of fertility in the region might also be explained by the relatively low incidence of infertility[4], both primary and secondary. The level of infertility in Ethiopia has been reported to be low as compared with the average for sub-saharan Africa, which is about 12 per cent [Abate and Morgan, 1986:523-545]. Estimates on the incidence of primary and secondary infertility made for the population of Shewa and Arssi also revealed that the levels are much lower than the average for the entire country reported by Abate and Morgan in 1986 [Assefa, 1990:220]. Evidence from the present study also show relatively lower incidence of infertility in the region. As indicated in Table 3.4.1, the level of primary infertility in the region, as measured by the proportion of childless women, is about 6.2 for the women aged 40-49 and 6.0 for those in 30-39 age group at the time of the census. The corresponding figures in rural areas are 5.8 and 5.2, respectively. While in urban areas they are 11.4 and 12.9 for the older and younger age groups, respectively.

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[4] See Glossary for the definition of this term.

Table 3.4.1

Proportion of Childless Women, Women with one Child and those with two or less Children among those aged 30-39 and 40-49 by Urban/Rural areas, Shewa 1984

	30-39			40-49		
Residence Status	Childless	One Child	<2 Children	Childless	One Child	<2 Children
Total	6.0	7.6	25.0	6.2	7.7	22.7
Rural	5.2	7.2	24.0	5.8	7.5	21.9
Urban	12.9	9.8	33.7	11.4	8.9	31.7

The proportion of women reported as having only one child in rural areas is 7.5 for the women in the age group 40-49 and 7.2 for those in 30-39. In urban areas, about 8.9 and 9.8 per cent of women aged 40-49 and 30-39 years are reported as having only one child at the time of the Census. Considering rural and urban areas together, the percentage are 7.7 and 7.6, respectively. The proportions of women with two or less children among those aged 40-49 and 30-39 years are 21.9 and 24.0, respectively in rural areas; while in urban areas, the figures are 31.7 and 33.7 for the older and younger women, respectively. When both rural and urban areas are considered together, 22.7 per cent of the women aged 40-49 and 25.0 per cent of those in the age range of 30-39 had two or less children at the time of the Census.

The higher proportion of childless women in urban areas is probably, due to the higher prevalence of sexually transmitted diseases. It might also be due to the relatively higher proportion of widowed, divorced or separated women in urban than

rural areas [Assefa, 1990:222]. Of all urban women in the age groups 40-49 and 30-39, for instance, about 40 and 24.9 per cent are either widowed or divorced/separated, respectively. In the rural areas, however, 17.0 of the 40-49 and 8.7 of the 30-39 years old women are either widowed or divorced/separated. As it has been argued by Assefa [1990:222], if marriage dissolutions take place either by divorce, separation or death of husband before child birth and if women remained unmarried for the rest of their reproductive period, the chance of having a child is very low as giving a birth outside marriage is not acceptable in a society like ours.

In general, the level of fertility in the region is considerably high by any standard and the possible factors that maintain such a high fertility pattern in the region are, more or less, those discussed above. All these factors, as indicated earlier, are conducive for high fertility. It is, however, important to note that, in addition to the factors discussed above there could also be other social, economic, and cultural factors that maintain such high fertility patterns in Shewa. In the chapters that follow, therefore, attempts have been made to examine the influence of some selected socio-economic factors on the level of fertility in the region using univariate, bivariate and multivariate analyses.

CHAPTER IV

FERTILITY DIFFERENTIALS IN SHEWA

4.1 Introduction

The main objective of this chapter is to examine the probable fertility differences among the sample population classified by some socio-economic variables; viz: province of residence (Awraja), urban-rural residence, education, marital status, activity status, occupation, migration status, religion, and ethnicity . The bare classification of the variables into subcategories and their definitions are as given in chapter III. In order to get a general picture of relationship between fertility and these variables, the analysis is carried out for the Shewa as well as for urban and rural areas of the region separately. Moreover,in most of the analysis for the total sample, education is used as a control variable.

In the analysis, the mean CEB is used as a dependent variable, while the socio-economic factors as independent variables. Although there is an indication of the existence of omission/under-reporting of children ever-born in Shewa region, it is assumed in the analysis that the extent of misreporting is the same in all socio-economic groups of the women. Meanwhile direct standardization technique is applied to control for the differences in the age composition of the women. It should, however, be noted that for the purpose of this particular analysis and that which follows, all women who did not state their parity are excluded. In other words, the analysis is based only on the information obtained from the remaining 64554 women.

The chapter also attempts to discuss some of the possible causes of the observed fertility differentials among the study population subgroups.

4.2 Fertility Differentials

4.2.1 Province of Residence(Awraja)

The data reproduced in this study, as shown in Table 4.2.1a, reveal the existence of some variations in fertility among the Awrajas(provinces) of Shewa. According to the data in this table, the highest age standardized mean CEB is in Kembata and Hadiya Awraja (3.68), followed by Haikoch and Butagira(3.67), and Jibat and Mecha (3.29). The lowest standardized mean CEB (2.54), on the other hand, is recorded for Tegulet and Bulga Awraja.

Examination of the data on the same table also indicates that the mean CEB for each age group are substantially higher in the former two Awrajas than in the others. The highest mean CEB in the age groups 20-24 and 25-29 are observed in Haikoch and Butagira; while in the remaining age groups, the highest value is found in Kembata and Hadiya Awraja. The completed fertility, i.e., mean CEB for women aged 45-49, also indicates highest fertility in Kambata and Hadiya Awraja, and lowest fertility in Tegulet and Bulga. As can be seen from Table 4.2.1a, the average parity for women aged 45-49 years in these two Awrajas are 6.20 and 3.95, respectively, implying a difference of 2.25 children. On the whole, the data given on the table above show fertility differentials among the provinces of Shewa.

Table 4.2.1a

Mean Number of Children Ever-Born by Five-Year Age Groups and Awraja, Shewa 1984.

Awraja	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Merhabete	3.00	1.80	2.84	3.86	4.22	4.78	4.68
	(2071)	(321)	(350)	(366)	(290)	(308)	(186)
Menz and Gishe	2.57	1.61	2.44	3.22	3.69	4.10	4.42
	(2365)	(396)	(419)	(427)	(344)	(280)	(220)
Yifat and Timuga	3.15	1.94	2.73	3.99	4.37	5.13	5.80
	(2716)	(438)	(461)	(481)	(412)	(360)	(217)
Tegulet and Bulga	2.54	1.42	2.32	3.16	3.80	4.04	3.95
	(4466)	(599)	(628)	(813)	(772)	(606)	(462)
Yerer and Kereyu	3.16	2.03	3.00	4.03	4.50	5.06	4.56
	(5445)	(955)	(1050)	(864)	(747)	(567)	(384)
Haikoch and Butagira	3.67	2.23	3.37	4.60	5.25	5.69	5.98
	(11078)	(1842)	(2432)	(1966)	(1670)	(1227)	(756)
Kembata and Hadiya	3.68	2.18	3.29	4.61	5.53	5.86	6.20
	(10248)	(1447)	(2014)	(1813)	(1686)	(1270)	(873)
Chebo and Gurage	3.06	1.60	2.72	3.79	4.73	5.17	5.17
	(10311)	(1210)	(1906)	(1925)	(1820)	(1470)	(898)
Menagesha	3.25	1.83	2.99	3.95	4.93	5.54	5.38
	(5818)	(897)	(940)	(961)	(868)	(735)	(467)
Jibat and Mecha	3.29	1.99	3.12	4.07	4.71	5.29	5.04
	(5819)	(829)	(918)	(940)	(1063)	(813)	(596)
Selale	3.18	1.92	3.02	3.96	4.82	4.73	4.96
	(4217)	(626)	(696)	(743)	(604)	(559)	(366)

+Standardized with respect to age using the age distribution of all women in the sample.

Note: Figures in parenthesis are number of women.

The observed fertility differentials among the Awrajas might be attributed, among other things, to differences in the pattern of marriage, age at first marriage, infant/child mortality, level of literacy and urbanization, religious and ethnic composition as well as incidence of infertility.

The relatively high fertility observed in some Awrajas could be due to early age at marriage. Early marriage extends the length of time that the woman will be at risk of child-bearing, widens the marriageable age bracket and consequently increases the number of married women. Data from this study also show that Awrajas with relatively high fertility have high proportion of currently married women and vice versa. For example, the proportion of currently married women in Kembata and Haidya, Haikoch and Butajira and Jibat and Mecha Awrajas comprise about 88, 87 and 85 per cent, respectively. The corresponding figure for Tegulet and Bulga and Menz and Gishe Awrajas is about 78 per cent.

Moreover, it is interesting to note that the proportions of divorced/separated and widowed women are higher in Awrajas with relatively lower fertility. It is observed that in Awrajas with a standardized mean CEB of 3 or less, about 15 per cent of the women were either divorced/separated or widowed at the time of the Census. In a non-contraceptive society like ours where the majority of births take place within marital union, the proportion of currently married women has a considerable effect on fertility. Accordingly the variation in the proportion of currently married women could be one possible explanation for the observed fertility differentials among the Awrajas of Shewa.

Levels of literacy and urbanization could also be used as supporting explanations. It is observed that Awrajas with standardized mean CEB of 3 or less have relatively lower proportion of illiterate women than those with a standardized mean CEB of more than 3. The proportion of illiterate women in Tegulet and Bulga Awraja, for instance, is about 74 per cent; the corresponding figure in Chebo and Gurage is about 96 per cent. Moreover, in some Awrajas which have high fertility the level of urbanization is observed to be low. For example, at the time of the census only about 3.5 per cent of the population of Kembata and Haidya and Chebo and Gurage Awrajas reported to live in urban areas [see OPHCC, 1989:53-62]. Furthermore, the high fertility observed in some Awrajas compared to others might be partly attributed to high infant/child mortality in the former than in the latter groups. Women in the high infant/child mortality group need to bear many children to compensate for the children they lost.

Religious and ethnic composition of the women could also account for some of the observed fertility differentials among the Awrajas of Shewa region. In section 4.2.8, for instance, it is shown that Protestants have higher fertility than any other religious groups in the region. It is also observed that most of the Protestant women (about 40 per cent) are from Kembata and Hadiya Awraja. Thus, the observed high fertility in Kembata and Hadiya Awraja might also be due to the high proportion of Protestants in this Awraja relative to the others.

The relatively high fertility observed for Kembata and Hadiya Awraja is also supported by the findings which showed that the

the Kembatas and Hadiyas are fertile than the other ethnic groups [see Section 4.2.9]. It is also interesting to note that Awrajas which had standardized mean CEB of 3 or less are located in northern Shewa and mostly inhabited by the Amaras. As it is discussed latter on, the Amaras are observed to have relatively lower fertility.

The other possible explanation for the observed fertility differences, might be the variation in the incidence of primary and secondary infertility. In order to examine the effect of infertility, proportion of childless women, women with one child and those with two or less children among those aged 40-49 years computed and presented in Table 4.2.1b. The results show that the proportion of childless women aged 40-49 is highest in Tegulet and Bulga (10.9 per cent), followed by Menz and Gishe (7.4) and Merhabete (6.9). The highest proportion of women with one child and those with two or less children among the women aged 40-49 are also observed in Tegulet and Bulga Awraja, each is 10.1 and 30.4 per cent, respectively.

The second highest incidence of secondary infertility is observed in Menz and Gishe, followed by Merhabete Awraja. Out of the total women in the age range of 40-49 in Menz and Gishe Awraja, about 9.5 and 27.7 per cent are reported as having only one child, and as having two or less children, respectively. The corresponding figures in Merhabete Awraja are 8.8 and 23.9 in that order. It is interesting to note that these three Awrajas had relatively lower levels of fertility as compared to the other Awrajas. It is also interesting to learn that these Awrajas are mostly inhabited by the Amaras. This, therefore, lends support

to the previous findings which indicate higher incidence of infertility among the Amaras .

Table 4.2.1b

Proportion of childless women, women with only one child, and those with two or less children among those aged 40-49 by Awraja, Shewa 1984

Awraja	Childless	One Child	Two or less Children
Chebo and Gurage	6.3	8.3	23.4
Haikoch and Butagira	3.1	4.9	16.9
Jibat and Mecha	4.2	4.9	16.9
Kembata and Hadiya	3.1	4.5	12.8
Menagesha	4.6	6.0	18.9
Menz and Gishe	7.4	9.5	27.7
Merhabete	6.9	8.8	23.9
Selale	6.0	6.1	19.1
Tegulet and Bulga	10.9	10.1	30.4
Yerer and Kereyu	6.1	7.7	19.9
Yifat and Timuga	6.2	8.1	22.7

In general, from the data in the above table, it can be seen that Awrajas with higher incidence of infertility have relatively lower fertility and those with lower incidence of infertility had relatively higher fertility. The observed higher fertility in Kembata and Hadiya, for instance, could possibly be attributed to the low incidence of childlessness. According to the data on Table 4.2.1b, among the women aged 40-49 in this Awraja, only 3.1 per cent reported to be childless at the time of the census. It

may, therefore, be concluded that the observed fertility differentials among the Awrajas might partially be attributed to the differences in the incidence of infertility, both primary and secondary.

4.2.2 Urban/Rural Residence

Table 4.2.2 presents the average number of children ever born for rural and urban areas. As expected, the standardized mean CEB suggest that fertility is relatively higher in rural than urban areas. The age standardized mean CEB for rural and urban areas are 3.32 and 2.82, respectively, implying a difference of 0.5 child. The pattern of higher rural than urban fertility is also observed invariably in all age groups. Indeed, the differential in the completed fertility, i.e., mean CEB of women aged 45-49, is higher than that of the other age groups. As can be seen from the table, the mean CEB for women in the age group 45-49 are 5.37 and 4.59 in rural and urban areas, respectively.

Controlling for education, it is also observed that rural women have relatively higher fertility than their urban counterparts in all educational categories (see Table 4.2.2). It can be seen from the table that the standardized mean CEB of rural women in the illiterate, read and write , and formal schooling categories are 3.33, 3.22 and 3.27, respectively. The corresponding figures for urban women under study are 2.96, 2.87 and 2.70. It is, of course, interesting to observe that the differential in fertility between rural and urban women is more substantial in the formal

Table 4.2.2

Mean Number of Children Ever-Born by Age, Urban/Rural Residence and Education, Shewa, 1984

Education/Residence Status	Average+ 15-49	Age Group 20-24	25-29	30-34	35-39	40-44	45-49
Total							
Urban	2.82	1.55	2.64	3.65	4.27	4.57	4.59
	(6703)	(1001)	(1117)	(1148)	(1080)	(642)	(470)
Rural	3.32	1.99	3.06	4.12	4.88	5.28	5.37
	(57851)	(8559)	(10697)	(10151)	(9196)	(7553)	(4955)
Illiterate							
Urban	2.96	1.74	2.78	3.73	4.55	4.54	4.72
	(2812)	(301)	(439)	(504)	(575)	(438)	(343)
Rural	3.33	2.00	3.08	4.13	4.89	5.27	5.36
	(52283)	(7424)	(9622)	(9422)	(8641)	(7252)	(4771)
Read and Write							
Urban	2.87	1.71	2.96	3.59	4.47	4.42	3.94
	(502)	(52)	(91)	(99)	(121)	(50)	(53)
Rural	3.22	1.93	2.78	3.77	4.92	5.48	5.34
	(2194)	(387)	(473)	(381)	(299)	(178)	(114)
Formal Schooling							
Urban	2.70	1.44	2.51	3.59	3.78	4.70	4.43
	(3382)	(648)	(586)	(542)	(383)	(153)	(74)
Rural	3.27	1.86	2.87	4.29	4.69	5.61	5.29
	(5355)	(741)	(601)	(344)	(256)	(121)	(69)

+Standardized with respect age by using the age distribution of all women in the sample as standard.

schooling than the other education group. According to the age standardized mean CEB, rural women in the illiterate, read and write and formal schooling categories had about 0.4, 0.4 and 0.6

more child than their urban counterparts. Moreover, the mean CEB in almost all age groups for all educational categories indicated that fertility is higher among rural than urban women. In general, the foregoing analysis based on the life time fertility showed that, the level of fertility is highest in the rural areas than in urban areas.

As indicated in the preceding chapter, similar patterns with respect to current fertility are also observed. Both the reported and adjusted fertility rates show that fertility is higher in rural than urban areas. Estimates of TFR for rural and urban areas on the basis of the relational Gompertz model, for instance, suggest that rural women had, on the average, 1.2 more children than urban women in 1984. In summary, consistent with our hypothesis, the analysis reveals rural/urban fertility differentials. Both current and life time fertility is higher in rural than urban areas. A similar pattern of higher rural fertility is observed when education is used as control variable.

The observed rural/urban fertility differences might be attributed, among other things, to differences in other factors such as age at marriage, and proportion of married, infant mortality and incidence of infertility. According the Census results for Shewa [OPHCC, 1989:41], for instance, the singulate mean age at marriage is higher in urban than rural areas. The estimated singulate mean ages at marriage are 17.6 and 20.4 years for rural and urban areas, respectively. The singulate mean age at marriage may be used as a proxy indicator of the degree of traditionalism of groups, because the more traditional the society, the lower the singulate mean age at marriage and hence

the higher the fertility level and vice versa. Moreover, in a country like Ethiopia where conception and birth take place in the context of some form of marriages and where the use of contraceptive is not widespread, the proportion of currently married women is considered as one of the fundamental determinants of fertility. Data produced for the present study reveal that the proportion of ever married women is higher in rural than urban areas. According to these data, about 89 per cent of rural and 77 per cent of urban women aged 15 to 49 years are ever-married at the time of the census [see Table 2.2.4].

Furthermore, available evidence indicates that the level of infant/child mortality is higher in rural areas than in urban areas. The 1984 Census results for Shewa region, for example, give an infant mortality rate of 101 and 111 per thousand births for urban and rural areas, respectively [OPHCC, 1989: 149]. Data from the present study also show higher incidence of child death among rural than urban women. The level of infant/child mortality might, therefore, be one of the factors accounting for fertility differentials between rural and urban areas of Shewa region, as it has strong positive effect on fertility level.

The variations in the incidence of infertility between rural and urban areas might also account for some of the observed rural/urban fertility differences. As discussed in chapter III the level of childlessness is higher in urban than rural areas. The level of secondary infertility, as measured by the proportion women having only one child and two or less children among those aged 30-39 and 40-49 years, are also higher among urban women than their counterparts in rural areas.

4.2.3 Education

The data reported for Shewa, as depicted in Table 4.2.3, reveal that as the level of education increases, the age standardized mean CEB decreases. This pattern also emerged when the mean CEB for each age group are considered.The differences in fertility among these educational categories are not, however, substantial. The age standardized mean CEB are 3.31, 3.13 and 2.95 for the illiterate women, for those who read and write, and for those with formal schooling, respectively. Moreover, based on the completed fertility,it is found that illiterates' fertility is higher by 8 and 9.5 per cent than that of the women in the read and write, and those with formal education, respectively. The fertility of women who read and write, on the other hand, is higher only by 1.4 per cent than those who had formal education.

A similar pattern of relationship between education and fertility is also observed in both rural and urban areas. For example, of all urban women, the illiterates have the highest fertility with an age standardized mean CEB of 2.75, followed by those who read and write (2.67) and those with formal schooling (2.48). In rural areas the corresponding figures are 3.36, 3.25 and 3.21, respectively. The difference between the fertility of the illiterates and those with some years of formal schooling is not, however, substantial, which is less than 0.2 child. When the reported mean CEB in rural areas are examined, the same pattern of negative relationship between education and fertility is found across all age groups; while, in urban areas, this

Table 4.2.3

Mean Number of Children Ever-Born by Age, Education and Urban/Rural Residence, Shewa 1984.

Urban/Rural Residence/ Education	Average+ (15-49)	Age Group 20-24	25-29	30-34	35-39	40-44	45-49
Shewa Region							
Illiterate	3.31	1.99	3.07	4.11	4.87	5.23	5.31
	(55095)	(7725)	(10061)	(9926)	(9216)	(7690)	(5114)
Read & Write	3.13	1.90	2.81	3.74	4.79	5.25	4.92
	(2696)	(439)	(564)	(480)	(420)	(228)	(167)
Formal Schooling	2.95	1.67	2.69	3.86	4.15	5.10	4.85
	(6737)	(1389)	(1187)	(886)	(639)	(274)	(143)
Urban							
Illiterate	2.75	1.74	2.74	3.73	4.55	4.54	4.72
	(2812)	(301)	(439)	(504)	(575)	(438)	(343)
Read & Write	2.67	1.71	2.96	3.59	4.47	4.42	3.94
	(502)	(52)	(91)	(99)	(121)	(50)	(53)
Formal Schooling	2.48	1.44	2.51	3.59	3.78	4.70	4.43
	(3382)	(648)	(586)	(542)	(383)	(153)	(74)
Rural							
Illiterate	3.36	2.00	3.08	4.13	4.89	5.27	5.36
	(52283)	(7424)	(9622)	(9422)	(8641)	(7252)	(4771)
Read & Write	3.25	1.93	2.78	3.77	4.92	5.48	5.38
	(2194)	(387)	(473)	(381)	(299)	(178)	(114)
Formal Schooling	3.21	1.86	2.87	4.20	4.69	5.01	5.29
	(57832)	(741)	(601)	(344)	(256)	(121)	(69)

+ Standardized using the age distribution of total, urban and rural women in the sample respectively

relationship is maintained in some age groups but it disappears in others. This might be due to memory lapse of women, which in turn results in under-reporting of births.

In general, true to our expectation,the foregoing analysis revealed an overall pattern of decreasing fertility with increasing education. But the magnitudes of differentials are small. In fact it seems from the data that even some exposure to rudimentary education would lead to a decline in fertility. It should, however, be clear that the read and write group consists of women who could read and write only at the time of the Census as a result of the ongoing literacy campaign in Ethiopia. Thus, a mere acquisition of the skill of reading and writing should not be taken as a mechanism which would lead to a decline in fertility. Consequently, the differences between the fertility of the illiterate women and those who read and write need not be expected to be much.

The fertility differences between the illiterates and those with some years of formal schooling also appeared to be not substantial. This situation might have arisen as a result of the classification of the women in the post-elementary levels of educational attainment with those in primary level owing to the small number of women in the former levels. As it has been argued elsewhere [see Alemseghed, 1989:60], this lumping together of women with varying levels of education has the potential effect of suppressing fertility differences among them. This is due to the fact that women in the primary level of education are presumably different from those in the post-elementary levels as far as the impact of education on fertility is considered.

The relatively lower fertility observed among the women who read and write compared to the illiterate women might be attributed to social and cultural practices such as strict adherence to the traditional practices of post-partum abstinence, prolonged breast-feeding and other factors which affect fertility negatively, but not to literacy per se. The difference in fertility between the illiterate women and those with some years of formal schooling, on the other hand, might be explained in terms of variations in age at first marriage and other related factors. The role of education in increasing age at marriage is well known. This reduces the number of married women at the younger ages. Even at the old ages, where most of the women have been expected to be married, the educational impact on fertility is quite unequivocal.

4.2.4 Current Marital Status

The empirical evidence from this study reveals fertility differentials by current marital status. This is born out by the data reproduced in Table 4.2.4a. Considering the standardized mean CEB, it appears that, as expected, the currently married women have higher fertility than the widowed, divorced/separated, or never married women. This pattern is also true when we examine the average parities for the age groups 30 and above. In the remaining age groups, however, the widowed have the highest fertility. The standardized mean CEB for the currently married, the widowed, divorced/separated and never married women are 3.45, 3.33, 3.28 and 1.54, respectively. Moreover, according to the

average parity for 45-49 age group, currently married, widowed and divorced/separated women have, respectively 5.59, 4.76 and 2.89 children at the end of their reproductive period. It should, however, be noted that the difference between the fertility of married and widowed women is less than only one child. This situation might have arisen from the fact that the widowed are likely to be older women and have mostly completed their fertility. According to the data on Table 4.2.4a, for instance, the majority of the widowed women, about 76 per cent, are above age 35 years. Moreover, the observed higher mean CEB among the widowed in 20-29 age groups might be due to the small number of cases in these ages and more importantly due to the quality of the fertility data.

Similar pattern of relationship between current marital status and fertility is observed in both urban and rural areas. In both urban and rural areas, both the standardized mean CEB and the average parities for the age groups 30 and over are highest for the currently married women, and lowest for the never married women. In rural areas, the age standardized mean CEB for the currently married, widowed, divorced/separated and never married women are 3.49, 3.39, 2.38 and 1.70, respectively. The corresponding figures in urban areas are 3.06, 2.90, 1.99 and 0.94 in that order [see Table 4.2.4a].

In short, the above findings give an impression of higher fertility among the currently married and lower fertility among the never-married women. It should, of course be, noticed that the differences between the fertility of married, and those of

Table 4.2.4a

Mean Number of Children Ever-Born by Age, Marital Status and Urban-Rural Residence, Shewa 1984.

Residence/Marital Status	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Shewa Region							
Never Married	1.54	0.55	1.16	2.00	2.19	3.39	2.89
	(4310)	(557)	(214)	(143)	(86)	(59)	(36)
Married	3.45	2.07	3.10	4.19	4.95	5.42	5.59
	(53739)	(8270)	(10876)	(10236)	(9023)	(6796)	(4225)
Widowed	3.33	2.56	3.31	3.90	4.84	4.65	4.76
	(2563)	(98)	(170)	(305)	(511)	(751)	(704)
Divorced/Separated	2.28	1.33	2.06	2.73	3.31	3.83	3.57
	(3942)	(635)	(554)	(615)	(656)	(589)	(460)
Urban							
Never Married	0.94	0.41	0.99	1.25	1.39	2.00	-
	(1152)	(178)	(69)	(40)	(23)	(7)	-
Married	3.06	1.98	2.94	4.00	4.70	5.13	5.18
	(4036)	(626)	(846)	(866)	(744)	(397)	(278)
Widowed	2.90	1.91	2.10	3.81	5.50	4.39	4.23
	(256)	(11)	(21)	(36)	(54)	(70)	(60)
Divorced/Separated	1.99	1.16	1.90	2.65	3.01	3.45	3.50
	(1259)	(186)	(181)	(206)	(259)	(169)	(131)
Rural							
Never Married	1.70	0.62	1.25	2.29	2.48	3.60	2.83
	(3158)	(379)	(145)	(103)	(63)	(53)	(35)
Married	3.49	2.08	3.11	4.21	4.97	5.44	5.62
	(49703)	(7644)	(10030)	(9370)	(8279)	(6399)	(3947)
Widowed	3.39	2.64	3.48	3.91	4.76	4.68	4.81
	(2307)	(87)	(149)	(269)	(457)	(681)	(644)
Divorced/Separated	2.38	1.40	2.15	2.77	3.51	3.99	3.59
	(2683)	(449)	(373)	(409)	(397)	(420)	(329)

+Standardized for age using the distribution of total, urban and rural women in the sample respectively.

divorced/separated and never married women are substantial. The observed lower level of fertility among the never married women is not unexpected in a country like ours, where births outside marriage are unacceptable.

In an attempt to control for the educational attainment of a woman, Table 4.2.4b shows the reported and standardized mean CEB by marital status and education. The standardized mean CEB still indicates higher fertility among the currently married women in all education groups. The average parity for women aged 45-49 also shows that fertility is relatively higher among the currently married women at all educational levels.

It is, of course, to be observed that the differences in the standardized mean CEB of married and widowed women is not substantial in each educational category. On the other hand, the fertility of married women in each age group is significantly higher than that of divorced/separated or never married once in all education groups. The standardized mean CEB for the currently married women in the illiterate, read and write, and formal schooling categories are 3.47, 3.36 and 3.32, respectively while that of the widowed are 3.40, 3.34 and 2.83 in the illiterate, read and write, and formal schooling groups, respectively. Finally it is interesting to note that the lowest fertility in each age group and in all educational levels is observed among the never married women.

Table 4.2.4b

Mean Number of Children Ever-Born by Age, Marital Status and Education, Shewa 1984.

Education/Marital Status	Average+	Age Group				
	15-49	20-24	25-29	30-34	35-39	40-49
Illiterate						
Never Married	1.68	0.60	1.41	2.28	2.44	3.24
	(2456)	(316)	(137)	(106)	(63)	(90)
Married	3.47	2.09	3.12	4.20	4.98	5.49
	(47190)	(6867)	(9370)	(9056)	(8180)	(10388)
Widowed	3.40	2.70	3.49	3.95	4.79	4.71
	(2391)	(79)	(149)	(271)	(471)	(1401)
Divorced/Separated	2.33	1.39	2.16	2.79	3.34	3.78
	(3058)	(463)	(405)	(493)	(502)	(925)
Read & Write						
Never Married	0.77	0.45	0.60	1.75	2.17	-
	(195)	(22)	(10)	(12)	(6)	-
Married	3.36	2.09	2.93	3.83	4.94	5.49
	(2208)	(370)	(508)	(434)	(353)	(310)
Widowed	3.34	2.00	2.67	4.70	5.07	4.39
	(64)	(5)	(6)	(10)	(14)	(28)
Divorced/Separated	2.13	1.02	1.78	2.58	3.92	3.16
	(229)	(42)	(40)	(24)	(48)	(56)
Formal Schooling						
Never Married	0.91	0.49	0.75	0.92	1.44	1.75
	(1656)	(218)	(67)	(25)	(18)	(4)
Married	3.32	1.97	2.93	4.18	4.44	5.49
	(4324)	(1027)	(997)	(741)	(489)	(322)
Widowed	2.83	1.93	1.73	2.96	5.62	4.40
	(107)	(14)	(15)	(24)	(26)	(25)
Divorced/Separated	2.00	1.21	1.80	2.89	3.12	1.81
	(650)	(130)	(108)	(96)	(106)	(66)

+Standardized using the age distribution of all women in the sample

In sum, the foregoing analysis reveals that fertility is higher among the currently married, followed by widowed, divorced/separated and never married women in both rural and urban areas as well as in the entire region, even after controlling for educational attainment. Moreover, the same pattern of relationship between marital status and fertility is evidenced in the age groups 30 and above.

Similar studies in Ethiopia also reported higher fertility for the currently married women than those women whose marriages are dissolved either through divorce, separation or death of husband. [Alemtsehay, 1988; Abdulahi, 1989].

4.2.5 Economic Activity Status

Evidence from this study reveals the existence of fertility differences between the women in the labor force (i.e active women) and those not in the labor force (inactive women). A cursory look at the array of data reproduced in Table 4.2.5a indicates a negative association, though weak, between fertility and economic activity status. According to these data, the mean CEB are lower for active women than that of the inactive women in all age groups. The age standardized mean CEB are 3.17 and 3.42 for the active and inactive women, respectively; while the average parity for women 45-49 are 5.07 and 5.69 for the former and latter groups of women, respectively. Although the differences between the fertility of these groups of women are not substantial as expected, the findings do not contradict with those of previous studies in the country. For example, the

difference between the standardized mean CEB between the active and inactive women amounted only to less than 0.3 child. These findings are comparable with those obtained by Alemseghed [1989:63] and Abdulahi [1989:226].

Table 4.2.5a

Mean Number of Children Ever-Born by Age, Activity Status and Urban-Rural Residence, Shewa 1984.

Residence/Activity Status	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Shewa							
Active	3.17	1.91	2.94	3.89	4.68	5.04	5.07
	(38061)	(5522)	(6508)	(6755)	(6262)	(5089)	(3468)
Inactive	3.42	1.99	3.11	4.34	5.04	5.53	5.69
	(26493)	(4023)	(5290)	(4532)	(4001)	(3101)	(1951)
Urban							
Active	2.32	1.31	2.19	3.08	4.00	3.98	4.35
	(2313)	(372)	(359)	(366)	(435)	(269)	(200)
Inactive	2.77	1.69	2.85	3.92	4.44	5.01	4.77
	(4390)	(627)	(757)	(778)	(645)	(373)	(270)
Rural							
Active	3.23	1.95	2.98	3.94	4.73	5.09	5.11
	(35748)	(5163)	(6164)	(6397)	(5840)	(4825)	(3274)
Inactive	3.53	2.04	3.16	4.43	5.15	5.61	5.83
	(22103)	(3406)	(4545)	(3759)	(3368)	(2732)	(1686)

+Standardized with respect to age using the distribution of all, urban and rural women respectively.

Similar pattern of lower fertility among active than inactive women is found in both urban and rural areas. The age standardized mean CEB as well as the average parities at all age

groups are lower for economically active women than those of inactive in both urban and rural areas [see Table 4.2.5a]. In rural areas, the standardized mean CEB for active women is 3.23, and for the inactive women it is 3.53, while in urban areas the corresponding figures are 2.32 and 2.77 for the former and latter categories, respectively.

It is, of course, to be noted that the difference in the standardized mean CEB between active and inactive women is higher in urban (about 0.5 child) than in rural areas (0.3 child). This might be attributed to the fact that in urban areas most of the active women understudy, about 93 per cent, are engaged in non-agricultural activities, while in rural areas the reverse is observed. It can be argued that women engaged in agricultural activities do not have a significant difference in the perception of family size norms than those of inactive women, and hence may not have substantially lower fertility relative to the latter group.

Controlling for education, the differences in fertility between these two groups of women (active and inactive) still exist (see Table 4.2.5b). It is observed from this table that, the standardized mean CEB are, as expected, lower for active women than those of inactive women in all educational categories. It is also observed that the reported mean CEB of active women are lower than their inactive counterparts across all age groups and in all educational levels. It is interesting to note from this table that the differences in the standardized mean CEB between the two groups of women increases as we go from the illiterate category to the formal schooling category, which are about 0.3

and 0.6 child in the former and latter categories, respectively. This, therefore, suggests that education has an important role in explaining the differentials in fertility between the women in the labor force and those not in the labor force.

Table 4.2.5b

Mean Number of Children Ever-Born by Age Group, Activity Status and Education, Shewa 1984.

Education/Activity Status	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Illiterate							
Active	3.21	2.00	3.00	3.94	4.73	5.06	5.08
	(33809)	(4657)	(5720)	(6104)	(5690)	(4809)	(3282)
Inactive	3.48	2.03	3.16	4.37	5.08	5.50	5.73
	(21286)	(1827)	(2463)	(2155)	(1980)	(1484)	(910)
Read & Write							
Active	2.95	1.71	2.72	3.50	4.51	-	-
	(1704)	(270)	(341)	(295)	(279)	(140)	(111)
Inactive	3.45	2.21	2.93	4.11	5.35	6.18	4.75
	(987)	(492)	(592)	(505)	(464)	(370)	(219)
Formal Schooling							
Active	2.63	1.54	2.31	3.38	3.75	4.45	4.28
	(2524)	(590)	(446)	(351)	(279)	(138)	(74)
Inactive	3.22	1.76	2.92	4.18	4.48	5.76	5.45
	(4213)	(1704)	(2235)	(1872)	(1557)	(1274)	(822)

+Standardized with respect to age using the distribution of all women in the sample as standard.

In general, from what has been discussed so far, it has been observed that fertility is relatively higher among the inactive women, and lower among the active women. The differences are not, however, substantial as expected. This weak association between labor force participation and fertility might be

attributed, among other things, to the classification of the population understudy into active and inactive groups. The active group consists of women working under different conditions, i.e. women working in the modern sectors, those working in the agricultural sector, self employed workers, and unpaid family workers. The majority of women in this group about 89 per cent, are however, engaged in agricultural activities, in which on-the-job child care is a usual practice. Keeping these points in view, therefore, one may not expect a substantially lower fertility among the active women, as their value orientations toward family size and behavior is not fundamentally different from that of the inactive women.

4.2.6 Occupation

Evidence of fertility differentials among women of differing occupational categories are also observed in this study. According to the data given on Table 4.2.6a, women engaged in the non-agricultural occupations have lower fertility than those engaged in the agricultural occupations. The standardized mean CEB for women in the former and latter occupational categories are 2.66 and 3.22, respectively, implying a difference of about 0.6 child per woman. The average parities of women in the non-agricultural occupations in all age groups are invariably lower than that of the women in agricultural occupations. Based on the completed fertility, it can be said that women in the former group have on average 0.91 child less than those women in the

Table 4.2.6a

Mean Number of Children Ever-Born by Age, Occupation and Urban/Rural Residence Shewa 1984.

Residence Type/ Occupation	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Shewa Region							
Non-Agricultural	2.66	1.49	2.38	3.42	4.12	4.26	4.24
	(4034)	(583)	(629)	(679)	(759)	(511)	(327)
Agricultural	3.22	1.96	3.00	3.95	4.75	5.12	5.15
	(33985)	(4922)	(5872)	(6064)	(5503)	(4575)	(3140)
Urban							
Non-Agricultural	2.28	1.31	2.18	3.08	3.92	3.77	4.37
	(2142)	(342)	(331)	(331)	(419)	(244)	(183)
Agricultural	3.15	1.92	2.43	3.65	6.19	5.77	4.31
	(129)	(13)	(21)	(23)	(16)	(12)	(16)
Rural							
Non-Agricultural	2.64	1.73	2.59	3.73	2.57	4.70	4.12
	(1892)	(241)	(298)	(348)	(340)	(267)	(144)
Agricultural	3.25	1.96	3.00	3.95	4.75	5.12	5.16
	(33856)	(4909)	(5851)	(6041)	(5487)	(4553)	(3124)

+Standardized for age using the total, urban and rural women in the sample as standards respectively.

latter group at the end of their reproductive life (see Table 4.2.6a).

The same pattern of lower fertility among the women in the non-agricultural occupations than those in the agricultural occupations has also been observed in both urban and rural areas of the region. In urban areas, the age standardized mean CEB for women in the non-agricultural and agricultural occupations are 2.28 and 3.15, respectively; in rural areas they are 2.64 and 3.25 in the former and latter occupation groups, respectively. Moreover, parity is observed to be higher at all age groups for the women engaged in agriculture than those engaged in non-agricultural occupations in both urban and rural areas (see Table 4.2.6a). It is interesting to observe that the differences between the fertility of women in these two occupational groups are higher in urban than in rural areas. This situation might be attributed to the urban environment which could affect the fertility of the urban women in the non-agricultural occupations or due to the small number of women in the agricultural occupations.

When controlling for the educational attainment, similar pattern of relationship between occupation and fertility is observed. As shown in Table 4.2.6b, the standardized mean CEB for women engaged in the non-agricultural occupations are lower than for women in the agricultural occupations at all educational levels. The average parity of active women in all age groups is also higher than that of the inactive women at all educational categories. It can be seen from this table that women engaged in non-agricultural occupations and who fall in the illiterate,

Table 4.2.6b

Mean Number of Children Ever-Born by Age, Occupation and Education, Shewa 1984.

Education/ Occupation	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Illiterate							
Non-Agricultural	2.81	1.67	2.57	3.64	4.33	4.38	4.27
	(2676)	(317)	(392)	(464	(525)	(397)	(277)
Agricultural	3.24	1.99	3.03	3.97	4.77	5.12	5.16
	(31131)	(4340)	(5328)	(5640)	(5165)	4410)	(3005)
Read & Write							
Non-Agricultural	2.67	1.25	2.52	3.00	4.21	4.37	4.64
	(290)	(24)	(46)	(44)	(72)	(43)	(22)
Agricultural	3.01	1.76	2.76	3.59	4.61	4.79	5.10
	(1419)	(246)	(295)	(251)	(207)	(97)	(89)
Formal Schooling							
Non-Agricultural	2.22	1.27	1.94	2.90	3.40	3.44	3.64
	(1062)	(242)	(190)	(168)	(162)	(70)	(28)
Agricultural	3.03	1.77	2.60	3.96	4.18	5.45	4.67
	(1422)	(331)	(249)	(171)	(131)	(67)	(45)

+Standardized for age using the distribution of all women in the sample as standard.

read and write, and formal schooling categories have standardized mean CEB of 2.81, 2.67 and 2.22, respectively; the corresponding values for those engaged in agriculture are 3.24, 3.01 and 3.03, respectively. According to these figures, women in the non-agricultural occupations and who are illiterate, able to read and write and had some years of formal education bear, on the average, 0.43, 0.51, and 0.81 child less than those in agriculture and who had the same level of education. These findings suggest that the relationship between occupation and fertility is stronger when women's status is relatively high as measured by education.

In general, the foregoing analysis of fertility differentials according to occupation reveals, as predicted, that women who worked in the non-agricultural sector tend to have lower fertility than those who worked in the agricultural sector. This pattern also emerged when rural/urban residence as well as education are controlled. The observed differences in fertility between women who worked in the agricultural and non-agricultural sectors might be explained in terms of differences in age at marriage and other intermediate factors. As is well known, work before marriage is associated with latter age at marriage and may contribute to lower fertility not only through its effects on the age at marriage but also through the likelihood of continued work after marriage [UN, 1987:277]. However, since data on these variables are not available, it is not possible to measure the extent of their effect on the observed fertility levels among the women in these two occupational groups.

4.2.7 Migration

Table 4.2.7a presents the average number of children ever-born by migration status for the total sample as well as for urban and rural women. But the evidence from this table does not show substantial fertility differences between migrants and non-migrants. The age standardized mean CEB for migrants is 3.28 as compared to 3.26 for non-migrants. Also, the average parities in all age groups do not indicate much fertility differentials between these two groups of women. This weak relation between migration and fertility may be explained, in terms of similarities in the characteristics of migrant and non-migrant women. As most areas of the country have the same pattern of high fertility, migrants in Shewa region may not be expected to have substantially higher or lower fertility than that of the non-migrants, other things being constant. Moreover, in a country like Ethiopia, where there are no much differences in socio-economic and cultural factors among the regions and sub-regions, it is not necessarily true to assume that migrants differ in their attitudes to family size and behavior from those of non-migrants.

When rural women are taken alone, the same pattern of relatively higher migrant than non-migrant fertility is observed in rural areas. The standardized mean CEB are 3.54 and 3.29 for rural migrants and non-migrants, respectively. The reported mean CEB also show the same pattern of higher migrant than non-migrant

Table 4.2.7a

Mean Number of Children Ever-Born by Age, Migration Status, Duration of Residence and Urban/Rural Residence, Shewa 1984.

Residence/ Migration Status	Average+ 15-49	Age Group 20-24	25-29	30-34	35-39	40-44	45-49
Shewa							
Non-Migrants	3.26	1.93	3.00	4.08	4.79	5.22	5.29
	(45747)	(6741)	(8144)	(7922)	(7129)	(5975)	(3907)
Migrants							
Total	3.28	1.97	3.06	4.05	4.89	5.24	5.29
	(18807)	(2819)	(3670)	(3377)	(3147)	(2220)	(1518)
< 6 Years	2.73	1.56	2.39	3.23	4.12	4.48	4.61
	(6634)	(1438)	(1331)	(974)	(780)	(501)	(292)
6-9 Years	2.89	2.35	2.91	3.52	3.70	4.30	3.94
	(2350)	(595)	(692)	(417)	(246)	(122)	(67)
10+ Years	3.67	2.45	3.69	4.58	5.31	5.57	5.54
	(9610)	(747)	(1605)	(1942)	(2093)	(1581)	(1145)
Urban							
Non-Migrants	2.85	1.50	2.57	4.31	4.76	5.23	5.03
	(921)	(141)	(109)	(105)	(97)	(83)	(62)
Migrants							
Total	2.58	1.55	2.64	3.59	4.22	4.48	4.52
	(5782)	(860)	(1008)	(1043)	(983)	(559)	(408)
< 6 Years	2.05	1.20	2.13	2.80	3.28	3.53	3.82
	(2290)	(472)	(451)	(342)	(260)	(120)	(65)
6-9 Years	2.42	2.03	2.67	3.34	3.51	3.93	3.65
	(889)	(175)	(202)	(190)	(128)	(58)	(34)
10+ Years	2.98	1.98	3.28	4.24	4.79	4.88	4.78
	(2533)	(195)	(341)	(501)	(586)	(378)	(307)
Rural							
Non-Migrants	3.29	1.94	3.00	4.08	4.79	5.22	5.30
	(44826)	(6600)	(8035)	(7817)	(7032)	(5892)	(3845)
Migrants							
Total	3.54	2.15	3.22	4.26	5.19	5.50	5.57
	(13025)	(1959)	(2662)	(2334)	(2164)	(1661)	(1110)
< 6 Years	2.99	1.74	2.52	3.46	4.54	4.78	4.84
	(4344)	(966)	(880)	(632)	(520)	(381)	(227)
6 to 9 years	3.13	2.48	3.00	3.67	3.90	4.63	4.24
	(1461)	(420)	(490)	(227)	(118)	(64)	(33)
10+ Years	3.80	2.62	3.80	4.70	5.52	5.78	5.81
	(7077)	(552)	(1264)	(1441)	(1507)	(1203)	(838)

+Standardized for age using the distribution of all, urban and rural women respectively as standards.

fertility across all age groups. It can be seen from Table 4.2.7a that the average parity for rural women aged 45-49 is 5.57 and 5.30 for migrants and non-migrants, respectively. In the case of urban areas, the reverse is, however, observed. The standardized mean CEB for non-migrants is 2.85, while that for migrants is 2.58. The average parity at the 45-49 age group for the non-migrants is 5.03, as compared to 4.52 for migrants. The relatively lower level of fertility among urban in-migrants may be explained in terms of their characteristics.

Therefore, to get a clear pattern of relationship between migration status and fertility, examination of the data on fertility by duration of continuous residence is undertaken and the results are also displayed in Table 4.2.7a. It is apparent from this table that migrants who stayed for less than six and six to nine years prior to the census date in the areas where they are enumerated have lower fertility than those of non-migrants. However, those migrants who resided at the place of enumeration ten years or more have higher fertility than the non-migrants and also than those migrants who stayed for less than six and six to nine years prior to the census.

It is also interesting to note that migrants who stayed for less than six years have relatively lower fertility than those in the 6 to 9 years duration category. The same pattern of migration fertility relationship is observed when the age specific mean CEB are considered. The standardized mean CEB for those migrants who resided at the place of enumeration for less than six, six to nine and ten or more years are 2.73, 2.89 and 3.67, respectively.

When the data are further examined by urban/rural residence, the fertility of non-migrants is still lower than the migrants who resided for ten or more years, but higher than those migrants in less than six and six to nine years duration categories. For example, in rural areas, the standardized mean CEB suggest that non-migrants have about 0.5 child less than those migrants in 10+ category, but have about 0.3 and 0.2 more child than those in the less than six and six to nine years duration categories. In urban areas, although non-migrants appeared to have relatively higher fertility than those of migrants, their fertility is also lower than those migrants who moved ten or more years ago. The above pattern is also evidenced invariably in all age groups when the average parities are considered. According to the data on Table 4.2.7a, migrant women in the ten or more years duration category have the highest mean CEB in almost all age groups in both urban and rural areas. At this point, it is important to note that the observed pattern of migrant/non-migrant fertility may be a function of real variations in the fertility of migrants or it may be caused by failure to control for some important variables like education.

Thus, controlling for education, Table 4.2.7b presents the mean CEB which could have been born to the non-migrant and migrant women who stayed for different period of times in the places where they were enumerated. The results suggest that those migrants who stayed for ten or more years have higher fertility than those of non-migrants at all educational levels.

Table 4.2.7b

Mean Number of Children Ever-Born by Age, Migration Status, Duration of Continous Residence and Education, Shewa 1984.

Education/ Migration	Averge+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Illiterate							
Non-Migrant	3.28	1.97	3.03	4.10	4.80	5.20	5.28
	(41274)	(5905)	(7385)	(7360)	(6706)	(5731)	(3746)
Total Migrant	3.41	2.07	3.17	4.12	5.04	5.29	5.41
	(13821)	(1820)	(2676)	(2566)	(2510)	(1959)	(1368)
< 6 Years	2.84	1.61	2.51	3.33	4.33	4.57	4.66
	(4465)	(893)	(911)	(727)	(605)	(437)	(264)
6-9 Years	3.12	2.38	2.96	3.55	3.84	4.42	4.68
	(1540)	(374)	(487)	(287)	(165)	(101)	(50)
10+ Years	3.80	2.63	3.73	4.62	5.40	5.59	5.63
	(7680)	(531)	(1253)	(1521)	(1722)	(1407)	(1043)
Read & Write							
Non-Migrant	3.14	1.72	2.67	3.80	4.72	5.49	5.34
	(1784)	(301)	(374)	(305)	(238)	(146)	(110)
Total Migrant	3.15	2.30	3.07	3.63	4.88	4.82	4.12
	(912)	(138)	(190)	(175)	(182)	(82)	(57)
< 6 Years	2.51	1.88	2.56	2.47	4.14	3.50	3.64
	(334)	(72)	(72)	(58)	(43)	(16)	(11)
6-9 Years	2.78	2.66	2.52	3.28	4.21	3.42	2.14
	(135)	(35)	(42)	(18)	(14)	(12)	(7)
10+ Years	3.63	2.89	3.89	4.38	5.26	5.52	4.62
	(427)	(27)	(73)	(96)	(119)	(54)	(39)
Formal Sch.							
Non-Migrant	2.88	1.69	2.71	3.86	4.06	4.86	4.26
	(2677)	(531)	(384)	(256)	(185)	(97)	(50)
Total Migrant	3.11	1.97	3.03	4.10	4.80	5.20	5.28
	(4060)	(858)	(803)	(630)	(454)	(177)	(93)
< 6 Years	2.40	1.42	2.04	3.07	3.16	4.04	4.53
	(1835)	(473)	(348)	(189)	(132)	(48)	(17)
6-9 Years	2.50	2.24	2.85	3.48	3.24	4.11	1.50
	(675)	(186)	(163)	(112)	(67)	(9)	(10)
10+ Years	3.30	1.90	3.46	4.44	4.77	5.31	4.56
	(1489)	(186)	(278)	(319)	(251)	(118)	(63)

+Standardized for age using the distribution of total women in the sample.

The migrant women in the remaining duration categories have, however, lower fertility than the non-migrant women at all levels of education. It is interesting to note that in all education groups, the fertility of women increase as we move from less than six to 10+ years duration categories. When the reported mean CEB for each age group are examined, they still show higher migrant than non-migrant fertility at all educational levels. The average parities of migrants in the 10+ years duration category in almost all age groups are also seen to be higher than that of the non-migrants and the migrants in the < 6 and 6-9 years categories in all education groups. In fact, there are some irregularities in the mean CEB for the 6-9 years duration category in the read and write and formal schooling education groups. This is, possibly due to the small number of women under these groups and also to the quality of the fertility data.

In general, as in the case of all migrants vis-a-vis non-migrants, the data examined indicate that migrants have relatively higher fertility than non-migrants. However, when the data are classified by duration of continuous residence, it appears that migrants who stayed for less than ten years have lower fertility than those of non-migrants. The fertility of non- migrants, on the other hand, is lower than that of migrant women who stayed for ten or more years prior to the census date.

The finding that migrants in the ten or more years duration category have higher fertility than the non-migrants is not in conformity with the hypothesis that states: "the longer the duration of continuous residence of migrants is, the more similar the fertility of migrants and non-migrants will become".

According to this hypothesis, migrants who stayed longer are expected to experience the same fertility with non-migrants. Data from this study, therefore, does not lend support to the above hypothesis. The finding is, however, consistent with that of the previous study in the country [see Almaz, 1990:105].

The data on mean CEB are further examined by identifying the forms of migration in the region. According to the standardized mean CEB given on Table 4.2.7c, women migrated from rural to rural areas have the highest fertility, followed by those women who migrated from urban to rural , from urban to urban and rural to urban areas. The standardized mean CEB for the rural to rural, rural to urban, urban to urban and urban to rural migrant women are, respectively 3.52, 2.76, 2.85 and 3.22.

In sum, the foregoing analysis suggests that it is not only the origin but also the destination of migrant which affect the migration-fertility relationship. Besides the evidence from this study generally validate the migrant/non-migrant fertility differentials, and particularly higher fertility among the migrants, who stayed for ten or more years prior the census date and who moved from rural to rural areas, relative to the non-migrants. The relatively higher level of fertility among the migrants may also explain the higher level of fertility in rural areas, as the majority of the migrants are migrated from rural to rural areas and stayed at the place of enumeration for more than ten years.

Table 4.2.7C

Mean Number of Children Ever-Born by Forms of Migration, Shewa 1984.

Forms of Migration	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Rural to Rural	3.52	2.15	3.22	4.26	5.20	5.52	5.57
	(12792)	(1915)	(2626)	(2300)	(2131)	(1630)	(1093)
Rural to Urban	2.76	1.58	2.66	3.52	4.18	4.35	4.58
	(4169)	(601)	(759)	(778)	(746)	(426)	(306)
Urban to Rural	3.22	1.95	3.39	4.09	4.39	4.74	5.18
	(233)	(44)	(36)	(34)	(33)	(31)	(17)
Urban to Urban	2.85	1.50	2.59	3.78	4.34	4.90	4.33
	(1613)	(259)	(249)	(265)	(237)	(133)	(102)

+Standardized with respect to age using the distribution of migrant women in the sample as standard.

It should be observed that in almost all age groups, the rural to rural migrants still have the highest mean CEB. If the urban-to-rural migrant women are considered as returnees, it would be interesting to note that this group of women have lower completed fertility than rural non-migrants but higher than that of urban natives. Moreover, migrant women in the rural-to-urban category have lower completed fertility than urban natives. The urban non-migrants also have higher parity at the 45-49 age group than those of migrants who are moved from urban-to-urban areas [see Tables 4.2.7c and 4.2.7d].

When the educational attainment of a woman is controlled, the rural-to-rural migrant women are still found to have the highest fertility in all education groups [see 4.2.7d]. This also holds in almost all age groups. The urban-to-urban migrants

have the second highest fertility in the last two educational categories, but have the third highest in the illiterate category. The lowest fertility observed in the last two education groups of urban-to-rural migrant women might be attributed to the smallness of the number of women who reported their parity.

Table 4.2.7d

Mean Number of Children Ever-Born by Age, Forms of Migration and Education, Shewa 1984.

Forms of Mig./ Education	Average+	Age Group				
	15-49	20-24	25-29	30-34	35-39	40-49
Illiterate						
Rural to Rural	3.52	2.15	3.23	4.24	5.20	5.55
	(11233)	(1546)	(2257)	(2092)	(1970)	(2608)
Rural To Urban	2.87	1.64	2.80	3.54	4.48	4.47
	(1946)	(210)	(328)	(359)	(418)	(514)
Urban to Rural	3.29	1.21	4.09	4.42	4.12	4.96
	(142)	(14)	(22)	(26)	(25)	(45)
Urban to Urban	2.89	1.80	2.36	3.69	4.35	4.78
	(500)	(50)	(69)	(89)	(97)	(160)
Read and Write						
Rural to Rural	3.49	2.55	3.15	3.77	5.47	5.43
	(443)	(88)	(104)	(82)	(62)	(49)
Rural to Urban	2.86	1.93	2.97	3.42	4.40	3.98
	(336)	(29)	(66)	(71)	(84)	(66)
Urban to Rural	1.34	2.33	1.25	-	5.5	-
	(16)	(5)	(2)	(2)	(5)	(1)
Urban to Urban	2.93	1.63	3.11	4.05	4.97	4.04
	(117)	(16)	(18)	(20)	(31)	(23)
Formal Schooling						
Rural to Rural	3.46	2.08	3.08	4.92	5.06	5.12
	(1108)	(278)	(265)	(123)	(99)	(65)
Rural to Urban	2.64	1.51	2.48	3.51	3.58	4.52
	(1881)	(362)	(364)	(345)	(243)	(151)
Urban to Rural	2.03	2.28	2.42	3.67	4.20	-
	(75)	(25)	(12)	(6)	(3)	(2)
Urban to Urban	2.80	1.41	2.63	3.79	4.16	4.56
	(996)	(193)	(162)	(156)	(109)	(52)

+Standardized using the age distribution of migrant women in the sample

4.2.8 Religion

Fertility differentials by religious groups have been investigated in Shewa. Table 4.2.8a presents the mean CEB by religion. As can be observed from this table, Protestants have the highest fertility followed by Catholics, Muslims and Orthodox Christians. These differentials hold for the standardized mean CEB as well as for the average parities of women in all age groups.

The age standardized mean CEB for Protestants, Catholics, Muslims and Orthodox are 3.86, 3.75, 3.36 and 3.15 respectively. It can be seen from Table 4.2.8a that, when the reported mean CEB for the age group 45-49 is considered, Protestants' fertility is higher than that of Orthodox by about 25 per cent.

The pattern of relationship between religion and fertility also holds true in rural areas. The highest age standardized mean CEB is found for Protestants, followed by Catholics, Muslims and Orthodox women. As can be observed from Table 4.2.8a, the average parities are also higher among the Protestants than any other religion group across all age groups. The difference between the completed fertility of Protestant and Orthodox women is more than one child. In urban areas, however, when the standardized mean CEB are considered the highest fertility is observed for Muslims, the second for Catholics, the third for Orthodox and the lowest for Protestants. The relatively lower level of fertility for Protestants and Catholics in urban areas might be, among other things, due to the small number of urban women who are followers of these religions.

Table 4.2.8a

Mean Number of Children Ever-Born by Age, Religion and Urban/Rural Residence, Shewa 1984.

Education/ Religion	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Total							
Orthodox	3.15	1.84	2.93	3.91	4.68	5.09	5.04
	(39567)	(5646)	(6690)	(6742)	(6415)	(5220)	(3534)
Protestant	3.86	2.25	3.52	4.92	5.81	6.23	6.28
	(4287)	(664)	(812)	(733)	(674)	(548)	(320)
Catholic	3.75	2.18	3.40	4.68	5.77	5.91	6.22
	(1142)	(195)	(233)	(180)	(180)	(100)	(96)
Muslim	3.36	2.04	3.03	4.17	4.84	5.31	5.64
	(18959)	(2943)	(3955)	(3558)	(2926)	(2262)	(1422)
Others	3.16	2.34	3.20	4.46	4.44	3.90	5.26
	(547)	(102)	(119)	(74)	(72)	(63)	(50)
Urban							
Orthodox	2.54	1.51	2.63	3.59	4.20	4.53	4.60
	(5770)	(848)	(960)	(965)	(938)	(556)	(423)
Protestant	2.52	1.55	2.61	3.90	4.72	3.42	-
	(167)	(29)	(31)	(29)	(18)	(5)	(7)
Catholic	2.68	2.43	2.60	4.00	4.67	4.00	-
	(33)	(7)	(5)	(9)	(3)	(2)	-
Muslim	2.80	1.77	2.72	3.91	4.67	4.96	5.35
	(687)	(110)	(114)	(135)	(115)	(73)	(37)
Others	2.17	1.50	2.17	3.90	3.67	2.67	-
	(35)	(6)	(6)	(7)	(2)	(6)	(3)
Rural							
Orthodox	3.23	1.89	2.98	3.97	4.76	5.15	5.10
	(33797)	(4798)	(5730)	(5777)	(5477)	(4664)	(3111)
Protestant	3.92	2.28	3.56	4.96	5.84	6.22	6.34
	(4120)	(635)	(781)	(704)	(656)	(543)	(313)
Catholic	3.79	2.18	3.42	4.71	5.79	5.95	6.28
	(1110)	(188)	(228)	(171)	(177)	(98)	(96)
Muslim	3.39	2.05	3.04	4.18	4.85	5.32	5.65
	(18272)	(2833)	(3841)	(3423)	(2811)	(2189)	(1385)
Others	3.20	2.40	3.26	4.34	4.41	4.04	5.43
	(512)	(96)	(113)	(67)	(70)	(57)	(47)

+Standardized using the age distribution of total, urban and rural women in the sample.

Controlling for education, it is also observed that Protestants have generally higher fertility than Catholics, Muslims or Orthodox at all level of education except the Catholic women with formal education [see Table 4.2.8b]. Of all women in the formal schooling category, the Catholics are found to have substantially higher fertility. The unusually high fertility among the Catholics in this category might be due to the smallness of the number of women in this category and also to errors inherent in the data like under-reporting errors.

To summarize, from the religious pattern of fertility depicted by the data in Tables 4.2.8a and 4.2.8b, it can be observed that Protestants have higher fertility than Catholics, Catholics have higher fertility than Muslims; while Muslims have higher fertility than Orthodox. The relatively higher level of fertility among the Protestants than the Catholics seems anomalous as the Catholic church strongly disapproves the use of modern contraceptives and if members of the church practice birth control at all, it is the natural methods which is not as effective as the former. On the other hand, there is no evidence indicating that Protestantism disapproves of human intervention in the process of procreation by using modern contraceptives.

Thus, the relatively higher fertility among the Protestant women is not because they are essentially more pronatalist than the other religious groups, but it is probably due to other factors such as early age at first marriage and low incidence of infertility. Analysis of the Census result for Arssi region [OPHCC, 1988:42], for instance, indicates that the mean age at marriage is lowest among the Protestants than other religious

Table 4.2.8b

Mean Number of Children Ever-Born by Religion and Education, Shewa 1984.

Education/ Religion	Average+	Age Group				
	15-49	20-24	25-29	30-34	35-39	40-49
Illiterate						
Orthodox	3.21	1.91	2.99	3.96	4.75	5.10
	(32901)	(4400)	(5475)	(5772)	(5625)	(8157)
Protestant	3.92	2.30	3.67	4.95	5.83	6.15
	(3243)	(469)	(608)	(577)	(573)	(767)
Catholic	3.77	2.13	3.49	4.65	5.80	6.02
	(898)	(136)	(187)	(156)	(167)	(177)
Muslim	3.37	2.05	3.06	4.18	4.84	5.43
	(17533)	(2624)	(3682)	(3342)	(2784)	(3590)
Read & Write						
Orthodox	2.97	1.76	2.85	3.51	4.72	4.59
	(1796)	(285)	(353)	(305)	(298)	(266)
Protestant	3.91	2.41	3.03	4.22	6.39	7.02
	(285)	(39)	(64)	(55)	(41)	(64)
Catholic	3.53	2.33	2.50	5.22	4.80	5.67
	(49)	(3)	(14)	(9)	(5)	(9)
Muslim	3.23	2.07	2.52	3.99	5.02	5.42
	(533)	(110)	(125)	(110)	(64)	(52)
Formal Sch.						
Orthodox	2.77	1.51	2.60	3.64	3.90	4.64
	(4855)	(959)	(861)	(660)	(491)	(329)
Protestant	3.72	2.06	3.07	5.10	5.25	6.51
	(758)	(156)	(140)	(100)	(60)	(37)
Catholic	4.02	2.30	3.28	4.67	5.75	7.70
	(195)	(56)	(32)	(15)	(8)	(10)
Muslim	3.30	1.90	2.77	4.01	4.67	5.93
	(883)	(204)	(147)	(105)	(78)	(40)

+Standardized using the age distribution of all women in the sample.

groups. According to this analysis, the singulate mean age at marriage for Protestant women is 15.3 years. The corresponding figures for Catholic, Muslim and Orthodox women are 16.2, 17.0 and 17.8 years, respectively. This, therefore, implies that the Protestant women tend to marry, on average 2.5, 1.7 and 0.9 years earlier than Orthodox, Muslim and Catholic counterparts; while the Catholic women tend to marry on average 0.8 and 1.6 years earlier than their Muslim and Orthodox counterparts.

In order to examine the incidence of infertility among the identified religious groups,the proportion of childlessness among the women aged 30-39 and 40-49 years have been calculated and presented in Table 4.2.8c. The results indicated that the

Table 4.2.8C

Proportion of Childless Women Among Those Aged 30-39 and 40-49 Years by Religion, Shewa 1984.

Religion	Proportion of Childless Women	
	30-39	40-49
Orthodox	6.6	6.9
Protestant	2.6	3.1
Catholic	2.5	5.1
Muslim	5.7	5.4
Others	10.3	8.0

Source: Computed by the author from the sample.

proportion of childless women among those aged 40-49 years is lower among Protestants (3.1) than Catholics (5.1), Muslims (5.4) or Orthodox Christians (6.9). Among the women aged 30-39 years, 2.6, 2.5, 5.7 and 6.6 per cent of Protestants, Catholics, Muslims and Orthodox Christians, respectively, are reported as childless. The figures give an impression of higher incidence of infertility among the Orthodox Christians and lower incidence among the Protestants and Catholics. The observed low level of childlessness among the Protestants might, therefore, explain the relatively higher fertility in this religious group.

The pattern of relationship between religion and fertility in rural areas is similar to that of the entire region. Hence, similar explanations could be given for the observed fertility differentials among the identified religious groups. In urban areas, however, consistent with the findings of the CSA for Addis Ababa [OPHCC, 1987] and also to other similar studies in Africa [UN, 1973:105], higher Muslim than non-Muslim fertility is observed. This situation may very well be a reflection of the general global trend of high fertility for Muslim populations. An additional factor may be that the urban women who are followers of the Protestant and Catholic religions are very few and as a result seemed to have lower fertility than that of Muslims. The variation in the incidence of childlessness, differences in age at marriage and other related factors may account for some of the observed differentials in fertility among the religious groups in urban areas.

4.2.9 Ethnicity

Results of this study reveal that ethnic differences are factors in fertility differentials among the women understudy. According to the data reproduced in Table 4.2.9a, the Welayitas have the highest standardized mean CEB, followed by the Hadiyas, the Kembatas, and the Oromos. This pattern is also observed for all age groups when the average parities are considered. The age standardized mean CEB for the Welayita, Hadiya, Kembata, and Oromo ethnic groups are 3.84, 3.73, 3.71 and 3.44, respectively. The Gurage, Alaba and Amara ethnic groups exhibited standardized mean CEB of 3.04, 3.06 and 2.85 , respectively.

In rural areas, the pattern of relationship between ethnicity and fertility is similar to that of the entire region. As can be seen from Table 4.2.9a, the highest standardized mean CEB is found for the Welayitas (3.97), followed by the Hadiyas (3.76), the Kembatas (3.74) and the Oromos (3.50). Women who belong to the Alaba, Gurage and Amara ethnic groups have standardized mean CEB of 3.07, 3.03 and 2.94, respectively. In urban areas, however, the highest standardized mean CEB which is 3.26 is observed among the Gurages. The Kembatas have the second highest standardized mean CEB (3.11), the Welayitas exhibited the third highest (2.89) and the Oromos the fourth highest (2.66). In fact, similar to rural and total areas of the region,the lowest standardized mean CEB is found among the Amara women. The average parities in almost all age groups also reveal higher fertility pattern among the Welayitas in rural areas and among the Gurages in urban areas. According to the mean CEB for women

Table 4.2.9a

Mean Number of Children Ever-Born by Age, Ethnicity and Urban/Rural Residence, Shewa 1984

	Average+	Age Group					
	15-49	20-24	25-29	30-34	35-39	40-44	45-49
Total							
Amara	2.85	1.68	2.64	3.57	4.19	4.61	4.67
	(15897)	(2373)	(2614)	(2788)	(2470)	(2000)	(1412)
Gurage	3.04	1.65	2.75	3.81	4.72	5.02	5.24
	(10248)	(1219)	(2036)	(2004)	(1801)	(1411)	(828)
Oromo	3.44	2.06	3.21	4.29	5.02	5.47	5.39
	(24349)	(3711)	(4277)	(4079)	(3836)	(3209)	(2141)
Hadiya	3.73	2.20	3.37	4.86	5.42	6.02	6.10
	(5029)	(764)	1104)	(807)	(807)	(482)	(381)
Kembata	3.71	2.25	3.30	4.51	5.55	5.85	6.36
	(5060)	(784)	(1024)	(937)	(759)	(688)	(374)
Alaba	3.06	2.21	2.88	3.98	4.08	4.37	4.56
	(1328)	(211)	(281)	(257)	(184)	(134)	(101)
Welayita	3.84	1.89	3.54	4.92	5.87	6.16	6.18
	(823)	(160)	(189)	(104)	(112)	(55)	(57)
Others	3.14	2.08	2.97	3.82	4.59	5.07	5.50
	(1786)	(332)	(281)	(317)	(301)	(214)	(129)
Urban							
Amara	2.38	1.44	2.41	3.40	3.91	4.47	4.06
	(3437)	(499)	(569)	(581)	(542)	(349)	(253)
Gurage	3.26	1.65	3.15	4.62	5.84	5.56	6.36
	(784)	(127)	(158)	(115)	(125)	(57)	(56)
Oromo	2.66	1.64	2.68	3.69	4.40	4.56	4.82
	(1561)	(203)	(222)	(299)	(273)	(168)	(122)
Hadiya	2.62	2.90	3.08	3.40	3.29	3.63	-
	(61)	(10)	(13)	(10)	(7)	(7)	(1)
Kembata	3.11	1.67	3.50	5.00	4.93	5.40	-
	(129)	(24)	(30)	(21)	(14)	(4)	(1)
Alaba	-	-	-	-	-	-	-
	(1)	-	-	-	-	-	-
Welayita	2.89	1.61	2.98	4.27	4.08	5.40	-
	(158)	(31)	(41)	(15)	(12)	(4)	(5)
Others	2.47	1.61	2.58	3.55	3.88	4.17	4.78
	(565)	(104)	(84)	(106)	(107)	(52)	(32)
Rural							
Amara	2.94	1.75	2.71	3.61	4.26	4.64	4.80
	12460)	(1874)	(2045)	(2207)	(1928)	(1651)	(1159)
Gurage	3.03	1.65	2.71	3.76	4.64	5.00	5.16
	(9464)	(1092)	(1878)	(1889)	(1676)	(1354)	(772)
Oromo	3.50	2.08	3.23	4.34	5.07	5.52	5.43
	22788)	(3508)	(4055)	(3780)	(3563)	(3041)	(2019)
Hadiya	3.76	2.19	3.38	4.88	5.44	6.05	6.11
	(4968)	(754)	(1091)	(797)	(800)	(475)	(380)
Kembata	3.74	2.27	3.29	4.50	5.56	5.85	6.37
	(4931)	(760)	(994)	(916)	(745)	(684)	(373)
Alaba	3.07	2.21	2.88	3.98	4.08	4.37	4.56
	(1327)	(211)	(281)	(257)	(184)	(134)	(101)
Welayita	3.97	1.96	3.70	5.03	6.08	6.22	6.25
	(665)	(129)	(148)	(89)	(100)	(51)	(52)
Others	3.40	2.29	3.13	3.96	4.98	5.35	5.73
	(1221)	(228)	(197)	(211)	(194)	(162)	(97)

+Standardized using the age distribution of total, urban and rural women in the sample.

aged 45-49, for example, the fertility of rural Welayitas is higher by 35 per cent than that of the Amaras; while urban Gurages fertility is higher than that of urban Amaras by 37 per cent.

When controlling for the educational attainment of the women, different patterns of relationship between ethnicity and fertility have emerged. Of all the illiterate women, for example, the Welayitas are found to have the highest standardized mean CEB (3.89), followed by the Hadiyas (3.77), the Kembatas (3.73), and the Oromos (3.48). Among the women who read and write, and those with some years of formal schooling, on the other hand, the Kembata had the highest standardized mean CEB, which is 3.89 for both categories; while the Hadiyas have the second highest standardized mean CEB, which are 3.58 and 3.56 in the former and later education categories, respectively. The Gurages exhibited the third highest standardized mean CEB in these two education groups; 3.38 in the read and write, and 3.31 in the formal schooling groups. The lowest standardized mean CEB in the illiterate , read and write, and in the formal schooling categories are found among the Amaras, the Welayitas and the Alabas, in that order (see Table 4.2.9b).

The observed inconsistencies in the pattern of relationships between ethnicity and fertility after controlling for education should not be attributed to the effect of education; but could possibly be due to the quality of data and more importantly due to the small number of women in some of the educational categories.

Table 4.2.9b

Mean Number of Children Ever-Born by Age, Ethnicity and Education, Shewa 1984

Education/ Ethnicity	Average+	Age Group				
	15-49	20-24	25-29	30-34	35-39	40-49
Illiterate						
Amara	2.93	1.77	2.74	3.64	4.27	4.66
	(12129)	(1705)	(1943)	(2192)	(1997)	(3064)
Gurage	3.03	1.63	2.74	3.80	4.68	5.09
	(9413)	(1037)	(1890)	(1879)	(1694)	(2180)
Oromo	3.48	2.11	3.23	4.32	5.06	5.46
	(22028)	(3265)	(3880)	(3763)	(3575)	(5150)
Hadiya	3.77	2.22	3.47	4.87	5.43	6.03
	(4220)	(618)	(914)	(723)	(744)	(801)
Kembata	3.73	2.26	3.32	4.49	5.53	5.95
	(4077)	(562)	(805)	(797)	(684)	(971)
Alaba	3.05	2.21	2.85	3.97	4.03	4.42
	(1251)	(198)	(264)	(243)	(178)	(231)
Welayita	3.89	1.91	3.68	4.88	5.89	6.22
	(638)	(118)	(155)	(86)	(93)	(102)
Read and Write						
Amara	2.69	1.50	2.54	3.16	4.32	4.29
	(1088)	(162)	(194)	(194)	(189)	(157)
Gurage	3.38	2.15	2.77	3.77	5.18	5.76
	(234)	(62)	(47)	(44)	(39)	(25)
Oromo	3.21	1.95	3.14	3.78	4.87	4.94
	(607)	(101)	(131)	(100)	(103)	(89)
Hadiya	3.58	2.27	2.76	4.92	5.38	5.76
	(268)	(44)	(84)	(39)	(26)	(33)
Kembata	3.89	2.40	2.97	4.19	5.95	6.93
	(326)	(47)	(73)	(67)	(41)	(67)
Alaba	2.44	2.00	3.56	4.40	5.40	-
	(43)	(6)	(9)	(10)	(2)	(3)
Welayita	2.39	2.00	3.00	4.67	5.45	-
	(37)	(5)	(9)	(6)	(7)	(4)
Formal Sch.						
Amara	2.56	1.43	2.28	3.36	3.51	4.46
	(2670)	(504)	(476)	(398)	(284)	(190)
Gurage	3.31	1.56	2.78	4.10	5.44	5.70
	(594)	(117)	(98)	(79)	(68)	(33)
Oromo	3.05	1.64	2.90	4.00	4.24	5.09
	(1708)	(344)	(266)	(216)	(157)	(110)
Hadiya	3.56	2.02	3.07	4.68	5.14	6.10
	(539)	(101)	(106)	(44)	(37)	(29)
Kembata	3.89	2.18	3.36	5.05	5.41	6.96
	(657)	(175)	(146)	(73)	(34)	(24)
Alaba	2.18	2.43	2.88	4.00	4.20	-
	(34)	(7)	(8)	(4)	(4)	(1)
Welayita	2.55	1.84	2.88	5.33	5.65	-
	(148)	(37)	(25)	(12)	(12)	(6)

+Standardized using the age distribution of all women in the sample.

In general, however small they are, fertility differentials among the different ethnic groups in Shewa have been observed in this analysis. Nevertheless, such differentials may not be attributed to ethnicity, per se. The apparent differences could perhaps be attributed to the influence of a multitude of social, economic and cultural factors. The variations in the level of infertility among the different ethnic groups might also account for some of the observed fertility differentials. Although there is no empirical evidence regarding the levels of infertility among the different ethnic groups from this study, another research conducted in Ethiopia showed the existence of variations in the levels of childlessness [Abate and Morgan, 1987:544]. According to this study, the Amara ethnic group had the highest incidence of childlessness, which, therefore, resulted in relatively lower level of fertility.

CHAPTER V

SOCIO-ECONOMIC FACTORS INFLUENCING FERTILITY: A MULTIVARIATE ANALYSIS

5.1 Introduction

In the preceding chapter, the influence of each of the socio-economic variables on fertility is examined factor by factor and also by considering two factors simultaneously. In the latter case, we have attempted to examine whether the pattern and size of fertility differentials for one variable observed vary systematically with the value of another. This procedure would help us to see whether the observed relationship between a variable of interest and fertility is attributable to another associated factor.

In this chapter, an attempt is made to examine the relationship between each of the predictors and fertility by controlling for the effect of more than two variables simultaneously through a multivariate technique. This would enable us to get the independent effect of each of the Socio-economic factors on the criterion variable, fertility, and thereby to determine its relative importance, when the effects of the other predictors are controlled.

The multivariate technique employed in this chapter is Multiple Classification Analysis (referred to as MCA). This technique, which is used to analyze data that are mostly nominally measured, is based on the following equation:

$$Y_{ij...n} = Y + a_i + b_j + ... + e_{ij...n}$$

Where $Y_{ij...n}$ is the score of a woman 'm' who falls in the i^{th} category of predictor A, j^{th} category of predictor B,...etc; Y is the grand mean of the criterion variable, a_i is the effect of membership in the i^{th} category of predictor A, b_j the effect of membership in the j^{th} category of predictor B, and $e_{ij...n}$ is an error term. In the MCA model, each independent variable is divided into two or more categories and mean values of the dependent variable and deviations from the grand mean for these categories are estimated, adjusted simultaneously for the effects of all other variables under consideration and their inter-correlations.

In order to get a general picture of the pattern of relationship between socio-economic factors and fertility, the MCA model is employed for the total sample as well as for urban and rural sub-samples separately. The analysis is also undertaken at the provincial level (i.e for each of the Awrajas separately). The dependent variable fertility, is measured in terms of number of children ever-born to women aged 15 to 49 years. The predictor variables[1] included in the analysis of the total sample are: Province of residence (Awrajas), Residence Status (urban/rural), Educational attainment (Illiterate, Read and Write, and Formal Schooling); Occupation (No Occupation, Agricultural and Non-agricultural); Migration/Duration of continuous residence (Non-migrant since birth, less than 6 years,

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[1] See Chapter III for the operational definitions of these variables.

6 to 9 years, and 10+ years); Marital status (Never married, Currently married, Divorced/Separated and Widowed); Religion (Orthodox, Protestant, Catholic, Muslim, and Others); and Ethnicity (Alaba, Amara, Gurage, Hadiya, Kembata, Oromo, Welayita and Others). Age of a woman at the time of the census is used as a covariate as older women usually have higher number of children ever-born than younger women.

Indeed, before applying MCA to determine the net effect of each predictor variable on fertility by adjusting for the other predictors, we have examined the interaction effect between the explanatory variables using the Analysis of Variance (ANOVA) technique. The results showed that the interactions are statistically insignificant. The relationship of fertility, (Number of Children ever-born) to each of the predictor variables is, therefore, additive across all the levels of other predictors.

5.2 Findings

5.2.1 The Regional Pattern

The results of the analysis on the relationship between the number of Children ever-born and the explanatory variables for the total sample as well as for both urban and rural sub-samples are presented on Table 5.2.1. The unadjusted deviations show the gross differences between the grand mean of the dependent

Table 5.2.1

Unadjusted and Adjusted[a] Deviations in Mean Number of Children Ever-Born by Predictor Variables and Urban/Rural Residence, Shewa 1984

Predictor Variables	Total Shewa					Urban Shewa[c]					Rural Shewa				
	No. of Women	Unadj. Dev.	Eta	Adju. Dev.	Beta	No. of Women	Unadj. Dev.	Eta	Adju. Dev.	Beta	No. of Women	Unadj. Dev.	Eta	Adju. Dev.	Beta
Province of Residence (Awraja)			0.13		0.12			0.19		0.09			0.13		0.15
Chebo and Gurage	10293	-0.04		-0.05		194	-0.14		-0.09		10099	-0.10		0.01	
Kaikoch & Butagira	11018	0.34		0.40		1111	0.75		0.39		9907	0.30		0.41	
Jibat and Mecha	5799	0.14		-0.18		420	0.41		0.01		5379	0.09		-0.18	
Kembata & Hadiya	10236	0.50		0.41		-[b]	-		-		10236	0.42		0.46	
Menagesha	5793	-0.15		0.03		1410	-0.64		-0.12		4383	0.15		0.10	
Menz and Gishe	2364	-0.77		-0.69		86	0.10		0.43		2278	-0.85		-0.87	
Merhabete	2070	-0.26		-0.29		127	0.41		0.36		1943	-0.34		-0.47	
Selale	4208	-0.17		-0.23		299	1.07		0.65		3909	-0.29		-0.32	
Tegulet and Bulga	4443	-0.70		-0.79		468	-0.62		-0.31		3975	-0.71		-0.96	
Yerer and Kereyu	5398	-0.35		-0.02		2189	-0.12		-0.15		3209	-0.11		0.04	
Yifat and Timuga	2693	-0.16		-0.14		322	0.28		-0.20		2371	-0.20		0.22	
Residence Status			0.08		0.02			X		X			X		X
Urban	6626	-0.69		-0.15		X	X		X		X	X		X	
Rural	57689	0.08		0.02		X	X		X		X	X		X	
Education			0.16		0.02			0.25		0.03			0.13		0.02
Illiterate	54959	0.18		0.02		2791	0.73		0.37		52168	0.11		0.02	
Read and Write	2680	-0.37		-0.07		492	0.57		0.16		2188	-0.50		-0.04	
Formal Schooling	6676	-1.34		-0.18		3343	-0.69		-0.34		3333	-1.38		-0.28	
Occupation			0.06		0.03			0.03		0.03			0.04		0.04
No Occupation	25216	0.12		0.10		2232	0.20		0.16		22984	0.13		0.14	
Agricultural	33174	0.01		-0.00		112	-0.10		-0.08		33174	-0.07		-0.09	
Non-Agricultural	5856	-0.56		-0.08		4322	-0.74		-0.53		1534	-0.43		-0.28	
Migration (Duration of Continuous Residence)			0.19		0.08			0.32		0.13			0.17		0.07
Non-Migrant	45735	-0.02		-0.01		920	-0.35		0.13		44815	-0.08		-0.02	
< 6 Years	6634	-1.07		-0.46		2290	-0.98		-0.42		4344	-0.83		-0.48	
6 to 9 Years	2350	-0.63		-0.19		889	-0.15		-0.18		1461	-0.59		-0.21	
10 Years & above	9596	0.99		0.42		2527	1.07		0.39		7069	1.14		0.44	
Marital Status			0.32		0.15			0.44		0.22			0.29		0.14
Never married	4289	-3.12		-1.16		1139	-2.53		-1.01		3150	-3.17		-1.20	
Currently Married	53551	0.28		0.18		3989	0.77		0.48		49562	0.21		0.15	
Divorced/Separated	3918	-0.98		-0.96		1242	-0.43		-0.64		2676	-0.99		-0.95	
Widowed	2527	0.92		-0.41		256	1.34		0.17		2301	0.87		-0.46	
Religion			0.07		0.03			0.05		0.01			0.06		0.04
Orthodox	39406	-0.12		-0.09		5702	-0.03		-0.01		33704	-0.10		-0.09	
Protestant	4280	0.60		0.30		165	-0.48		-0.01		4115	0.59		0.33	
Catholic	1135	0.33		0.16		30	0.05		0.10		1105	0.28		0.18	
Muslim	18904	0.11		0.01		685	0.35		0.21		18219	0.04		0.00	
Others	590	-0.24		-0.03		44	0.30		0.24		546	-0.31		0.00	
Ethnicity			0.11		0.06			0.10		0.06			0.10		0.09
Alaba	1320	-0.31		-0.68		1	-		-		1319	-0.39		-0.72	
Amara	15801	-0.48		-0.06		3389	-0.21		-0.09		12412	-0.44		-0.02	
Gurage	10225	-0.04		-0.23		778	0.64		0.42		9447	-0.12		-0.34	
Hadiya	5020	0.34		0.09		61	-0.12		-0.02		4959	0.28		0.15	
Kembata	5050	0.51		0.18		129	-0.08		0.20		4921	0.48		0.26	
Oromo	24281	0.18		0.16		1546	0.21		-0.04		22735	0.14		0.17	
Welayita	812	0.08		0.03		152	-0.48		0.10		660	0.29		0.21	
Others	1806	-0.15		-0.12		570	-0.05		-0.03		1236	0.04		-0.18	
Grand Mean			3.50					2.81					3.58		
Adjusted Multiple R_2			0.578					0.608					0.574		
R^2			0.334					0.370					0.330		
Stat. Signifi.			0.00					0.00					0.00		

[a] Adjusted for all other predictors and covariate age

[b] - Indicates fewer than 5 women

[c] Kembata& Hadiya Awraja was excluded from analysis of the urban sub-sample, since no women from this awraja was reported to live in urban areas.

X Not Applicable

variable for all women in the sample/sub-sample, and the mean value of that variable for women with a specific characteristic. The adjusted deviations are the differences between the fertility of women with a given characteristic and that of the total women controlling for the effects of all other predictor variables and covariate in the model.

From Table 5.2.1, it can be seen that, both before and after controlling for the other predictors and covariate age, province of residence affects fertility considerably. The unadjusted deviations from the grand mean showed a differential of about 1.3 children between the highest and lowest groups; while the corresponding difference in the adjusted figures is 1.2 Children. The independent effect of province of residence is more substantial in rural than urban areas when the other predictors and age are held constant. The findings therefore suggest that this variable is one of the most crucial factors affecting fertility in Shewa, particularly in rural areas.

The relationship between residence status and fertility is considered in this analysis. Both the unadjusted and adjusted results revealed, as anticipated, an inverse relationship between these two variables (see Table 5.2.1). However, the relationship is slightly reduced when the other predictors and age are allowed for. According to the adjusted series, urban women had, on the average 0.2 child less than their rural counter parts. Thus, though its effect is not substantial, residence status is an important factor in accounting variation in fertility in Shewa.

It is generally hypothesized not only that at any given time, fertility and the level of education are negatively related but also that improving educational attainment of a given society in the course of socio-economic development will contribute to declining fertility. The data for the total sample on Table 5.2.1 also showed an inverse relationship between educational attainment of women and fertility both before and after controlling for the effect of the specified variables. Whereas the difference between the illiterates and those who had formal education is 1.52 children in the unadjusted series, the corresponding difference under adjustment is reduced to 0.20 child.

The pattern of a negative relationship between education and fertility is also evident among urban and rural women, although the effect is more pronounced in urban areas. According to the adjusted series, there is a differential of 0.71 and 0.30 Child among the urban and rural women, respectively. The results also suggest that if the formal schooling category is further classified according to different educational levels, strong fertility differentials with respect to education would be evident. The decrease in the range in fertility among the three education categories after adjustment,nevertheless, indicated that the fertility differentials might be accounted for by differences in the Socio-economic and demographic characteristics of these women. But, on the whole, the results for the total

sample as well as among rural and urban women, show that education is an important factor affecting fertility in Shewa.

Studies conducted in many parts of the world have often found a negative relationship between certain occupational groups and fertility, particularly those in the modern sector of the economy. Evidence from this analysis also reveals, as expected, an inverse relationship between non-agricultural occupations and fertility among the total women as well as among rural and urban women. According the unadjusted series, the difference between no-occupation (inactive) and non-agricultural occupation groups is 0.68 child, the corresponding difference from the adjusted series is less than 0.2 child. Indeed, the negative influence of occupation is more substantial among urban than rural women. The adjusted deviations imply a differential of 0.69 and 0.42 child between non-agricultural occupation and no-occupation groups in urban and rural areas, respectively (See Table 5.2.1). Although the relative contribution of occupation is reduced when adjustment is made for the effects of the other variables, the findings indicate that occupational status of women has an influence on the level of fertility in the region.

The effect of migration or duration of continuous residence is examined in this study and the results show that this variable is very powerful in accounting variation in fertility among the total sample as well as among the urban and rural women. As can be seen from Table 5.2.1, both the unadjusted and adjusted figures suggest a positive relationship between duration of

continuous residence of migrants and fertility. According to the unadjusted series in the total sample, the difference between the 10+ and <6 years duration categories is 2.06 children; while the corresponding differences in the adjusted series is reduced to 0.98 child. It is to be noted that, in both the unadjusted and adjusted series, the fertility of non-migrants is higher than those migrants in the <6 and 6-9 duration categories, but lower than those in the 10+ category. When the data are analyzed for urban and rural sub-samples separately, the same pattern of relationship between duration of continuous residence of migrants and fertility is observed. The independent effect of this variable is, however, more dominant among rural than urban women. According to the adjusted series, the difference between the <6 and 10+ duration categories in urban areas is 0.81 child; while this difference in rural areas is 0.92 child. Therefore, the above findings of strong association between fertility and migration validated the results of the analysis in the previous chapter and are consistent with our hypothesis.

Regarding fertility and marital status, the analysis reveals that the association is more strong than any other predictor in the region. Both the unadjusted and adjusted deviations suggest that marital status is the most powerful variable in explaining variation in fertility in Shewa. Based on the unadjusted results, a positive relationship is found between the widowed and fertility. However, the adjusted results show, as expected, higher fertility among the currently married than those of

widowed, divorced/separated or never-married ones. According to the latter series, married women have 1.34 children and 0.59 child more than the never-married and widowed women , respectively. Similar pattern of relationship between current marital status and fertility is observed in both urban and rural areas, both before and after adjustments for the effects of the other predictors and covariate age. The differentials, however, appear to be more substantial in rural than urban areas. The differences between the married and never-married groups in the adjusted series are 1.66 and 1.18 children among the rural and urban women , respectively. The results of the adjusted figures, besides confirming our hypothesis, also suggest that marital status is the most important predictor of fertility in the total region as well as in both urban and rural areas.

It has been often argued that religion is one of the factors which exert influences on fertility. The empirical evidence from this analysis also reveals that religion is an important variable accounting for variation in fertility in Shewa. As it can be seen from Table 5.2.1, there is a positive relationship between Protestant religion and fertility in the total sample. Where as the difference between Protestants and Orthodox Christians in the unadjusted series is 0.72 child, the corresponding difference under adjustment is 0.39 child. In rural sub-sample, similar pattern of a positive relationship between Protestant religion and fertility is observed. In urban sub-sample, however, a positive relationship between Muslims and fertility is evidenced.

The differences between the highest and lowest groups under adjustment are 0.42 and 0.22 child among rural and urban women , respectively. On the whole, the findings suggest that religion is one of the important factors affecting the level of fertility in Shewa.

Ethnic origin has been identified as one of the factors accounting for the observed fertility differences among the population groups and sub-groups in the world. The results of the present analysis also show that ethnicity has a considerable effect on the level of fertility in Shewa. According to the adjusted series, the highest fertility is found for Kembata ethnic group, and the difference between the fertility of this ethnic group and that of Alaba amounted to 0.86 Child. The same pattern of relationship between ethnicity and fertility is observed in rural areas (See Table 5.2.1). In urban areas, however, the Gurages are found to have the highest fertility. Indeed, the differentials between the highest and lowest ethnic groups, according to the adjusted series, are more substantial in rural than urban areas, which are 0.98 and 0.51 child , respectively. In general, the findings of the analysis suggested that ethnicity is also an important explanatory variable of fertility in the whole sample, as well as in both urban and rural sub-samples.

In the foregoing discussions, we have attempted to see the relationship between socio-economic variables considered in the study and fertility. We now move to examine the relative

importance of each of the socio-economic variables after adjusting for the effect of the other predictors and covariate age.

As it has been argued elsewhere [See Ogawa, 1980:111-147], the closeness of the relationship between predictors and a criterion variable in the MCA can be measured by different summary statistics such as the beta or beta^2 coefficients or the percentage of variance in the dependent variable explained by a certain predictor, net of others. Indeed, if the predictors are uncorrelated to each other the results of these statistics are comparable. Since examination of the correlation matrix indicated no cause of alarm for multi-collinearity among the selected predictors in this study, we have used the beta coefficient for determining the importance of each predictor relative to the others.

The beta coefficient measures, on the basis of adjusted deviations, the ability of a given predictor to account for variation in the dependent variable. This coefficient is often compared to the partial correlation coefficient in multiple regression analysis.

Table 5.2.1 presents the beta coefficients for each predictor in the total sample as well as in urban and rural sub-samples. Examination of these coefficients reveals that, of the eight predictors considered in the total sample, marital status is found to be the most powerful factor in accounting for variation in fertility. The next important factors is province of

residence, followed by migration and ethnicity, having beta values of 0.12, 0.08 and 0.06 , respectively. Occupation and religion stood as the fifth important factors, with a beta coefficient of 0.03. Education and residence status are also important but to a lesser extent. The selected eight predictor variables together accounted for 33.4 per cent of the variation in fertility in Shewa as shown by the value of R^2.

When urban women taken alone, as shown in Table 5.2.1, marital status is still the most crucial factor, followed by migration, province of residence and ethnicity in that order. Education and Occupation had considerable effects on fertility, next to the above variables. The effect of religion on urban fertility is, however, minimal, as suggested by its beta value which is 0.01. The amount of variation in fertility explained by the explanatory variables is 37 per cent [see the R^2 value at the end of Table 5.2.1].

In the case of rural women however the configuration has changed slightly. As can be observed from the table, the effect of province of residence is more dominant than that of marital status, and the respondent's ethnic origin stands as the third most significant variable. Migration is the fourth, and occupational status and religions affiliation of a woman are the fifth most important factors in explaining variation in fertility. Education is the least important variable influencing fertility in rural Shewa. The total variation in fertility

explained by the selected Socio-economic variables is 33.0 per cent.

In sum, from what has been discussed so far, it may be said that marital status, province of residence, migration status and ethnicity are the four most important factors which could account for a larger proportion of the variance in fertility in the total Shewa as well as in both urban and rural areas of the region. The remaining predictors are also important but to a lesser extent. The changes in the relative importance of these variables in urban and rural areas, however, suggested that variables affecting fertility of urban women might be different from those of rural women.

5.2.2 The Provincial Pattern.

In this sub-section, we have attempted to examine whether the pattern of relationship between socio-economic variables and fertility observed for the region holds in each of the eleven Awrajas of Shewa.

The unadjusted and adjusted deviations from the grand means together with the eta and beta coefficients for each predictor by Awraja are given in Appendix IV. As can be seen from the results, the relationship between socio-economic variables and fertility follow the regional pattern with slight but important variations. Both the unadjusted and adjusted deviations indicate

that place of residence is inversely related to fertility. According to the adjusted series, there is a differential of 0.3 or more child between rural and urban respondents in almost all Awrajas. The differential is more substantial in Menagesha Awraja, where the corresponding difference is 1.56 children.

Consistent with the regional pattern, both the unadjusted and adjusted results revealed a negative relationship between education and fertility in all Awrajas. Occupation is also found to have an inverse relationship with fertility in all the Awrajas and remained so when adjusted for the effects of the other predictors and covariate age.

Migration has a considerable effect on the level of fertility in almost all Awrajas. Both the unadjusted and adjusted series show the same pattern of relationship between migration and fertility, namely a positive relationship between duration of continuous residence of migrants and fertility. According to the adjusted series, the difference between the 10+ and <6 duration categories is more than 0.5 child in the majority of the provinces. Indeed, the differential is more pronounced in Haikoch and Butagira, and Jibat and Mecha Awrajas, where it is about 1.1 children.

As it is true in the total region, marital status in the provinces is also more associated with fertility than any other predictor in the model and remained so when the other predictors and covariate age are held constant. According to the adjusted

series, in all the Awrajas, the difference between the highest and lowest groups is more than one child.

The results of both the unadjusted and adjusted effects of religion and ethnicity are mixed. According to the adjusted series there is a positive relationship between Protestant religion and fertility. It is also observed that Catholics had higher fertility than Protestants, Orthodox christians and Muslims; and Muslims had higher fertility than Catholics, Protestants and Orthodox respondents. Orthodox Christians, on the other hand, tended to have slightly higher fertility among the four main religious groups in Merhabete, Menz and Gishe and Yifat and Timuga Awrajas.

Ethnic origin of a woman has also a considerable effect on fertility in all Awrajas. In most Awrajas, as suggested by the adjusted series, the Oromos have higher fertility, in some others the Kembatas and Hadiyas had higher fertility and in still others the Welayitas had higher fertility than any other ethnic group. The Amaras, on the other hand, had relatively higher fertility in Jibat and Mecha and Selale awrajas. In sum, in spite of the observed differences in the patterns of relationship, the findings on the whole suggest that religion and ethnicity are important predictors of fertility in all the Awrajas.

Finally, examination of the magnitude of beta coefficients for each predictor in Appendix IV indicates that marital status, migration status, and ethnicity are the most important factors which could account for the greatest amount of variation in

fertility in most of the Awrajas. Occupation, religion and education are also important explanatory variables. The effect of residence status is, however, less pronounced in most of the Awrajas. As can be seen from the values of adjusted R^2, the amount of variation in fertility explained by the selected predictor variables in each Awraja is more than 30 per cent.

5.3 Summary and Discussion

The main interests in the foregoing analysis are to measure the independent effect of each of the socio-economic variables considered, after controlling for the other predictors and covariate age, to determine its relative importance in explaining variation in fertility in Shewa and thereby to test the validity of the hypothesis of the study. The findings of the analysis are almost similar to those obtained by univariate and bivariate analyses in Chapter IV. In general, the current marital status is found to have a greater effect than any other independent variable considered both at the regional and provincial levels. This is also true when the analysis is undertaken for urban and rural areas separately. Such a finding is not unexpected since in a country like Ethiopia where the majority of births take place within the context of some form of marriage and where the use of modern contraceptives is not widely spread, marriages offers more frequent and predictable opportunities for coitus. The adjusted deviations also confirm our hypothesis regarding

differentials in fertility by current marital status. That is, the currently married women have higher fertility than the widowed, or those with marriage dissolutions (i.e divorced and separated). This pattern of relationship also holds in both urban and rural areas as well as in the provinces of the region.

The level of education is inversely related to fertility in the total, urban and rural areas of the region and also in the provinces. Although the effect of this variable after controlling for the other predictors is not substantial, the findings support our hypothesis which states that fertility decreases as the level of education increases. Education has important roles in affecting fertility negatively. It delays the age at marriage by keeping large number of marriageable young women in school and thereby reducing the duration of exposure to the risk of child bearing. Education changes attitudes towards the use of contraception. It also changes the status of women and hence reduce their fertility.

A negative, albeit weak, relationship between occupational status of women and fertility is found at the regional and provincial levels as well as in both urban and rural areas of the region. However, the reduction in the range of fertility when the relevant independent variables are controlled, suggest much of the fertility differentials by occupation groups could be accounted for by differences in the socio-economic and demographic characteristics of these women. The overall findings that occupation is negatively related to fertility confirmed our

hypothesis and is also consistent with that of similar studies in the country and other parts of the world [see Abdulahi, 1989: Alemseghed, 1989]. The weak association of these two variables on the other hand, suggest that there is no greater incompatibility between the roles of mother and worker among the active women in Shewa region. This is not unexpected, as the majority of the economically active women aged 15-49 years, more than 90 per cent in the region, are engaged in agriculture which does not necessarily take away a woman far from her home. Moreover, since mother substitutes who can help look after children and other domestic cares are more likely to be available in the country, even those women who work in the modern sector of the economy may not have any difficulty in bearing and rearing a child and participating in the labor force simultaneously.

Place of residence (urban/rural) has a negative effect, though weak, on fertility. In line with our hypothesis, urban women are found to have relatively lower fertility than their rural counterparts both in the entire Shewa and in the provinces of the region. The small differentials under adjustment in the total region as well as in the provinces, however, indicate that the relationship of place of residence to fertility is weak in the absence of the other predictors. Moreover, it may be argued, this weak association is possibly the result of the little or no difference between urban and rural areas of the region in terms of social, economic and demographic factors.

Province of residence is found to have a relatively strong association with fertility. In fact, the effect of this variable is stronger than some of the other predictors in the total shewa as well as in the urban and rural areas of the region. But the question is whether this effect is due to province of residence per se or to some other intervening factors such as differences in the incidence of infertility, age at marriage, breast feeding, ...etc. This would also require a greater investigation using a more detailed information.

The effect of migration on fertility is examined in this study and a strong positive relationship between migrants fertility and duration of continuous residence is found both at the regional and provincial levels. The same pattern of relationship between these two variables also emerges in both urban and rural areas of the region. In fact, the effect is more pronounced in urban than rural areas. These findings, therefore, lend support to the hypothesis that the longer the duration of continuous residence of migrants the higher is their fertility.

Religion and ethnicity have also considerable influence on fertility. Indeed, true to our hypothesis, the finding revealed strong fertility differentials among the identified religion and ethnic groups. The independent effect of ethnicity is, however, more pronounced than that of religion. In short, these variables are important in accounting for variations in fertility in total, rural and urban areas of Shewa region as well as in the provinces.

In sum, the foregoing analysis shows fertility differentials among the identified socio-economic groups both before and after adjustment for the effects of the specified variables included in the model. Although a significant reduction in the range in fertility is noted, the fertility differentials still persist after adjustment. The reduction in the range of fertility suggests that much of the observed fertility differentials are accounted for by the differences in socio-economic and demographic characteristics of the women under study. The fertility differentials observed after adjustment might, however, be attributed to the exclusion of some important variables like income, infant/child mortality, age at first marriage, duration of marriage and breastfeeding as well as use of contraceptives from the analysis.

Examination of the beta-coefficients for each predictor in the total sample as well as in the sub-samples indicates that marital status, province of residence, migration and ethnicity are the most crucial factors which could account for the greatest proportion of the variance in fertility in the region. Occupation, education, religion and residence status are also important but their relative impact on fertility is less than that of the other predictors. By and large, the selected socio-economic variables are important predictors of fertility and could account for more than 30 per cent of the total variation in fertility in the total sample as well as in all the sub-samples.

CHAPTER VI

SUMMARY AND CONCLUSION

6.1 Introduction

The objectives of the present study are to determine the level of fertility in Shewa region of Ethiopia, on the one hand, and to examine the extent of the relationships between socio-economic factors and fertility on the other. In an attempt to achieve these objectives, a 5 per cent sample of women aged 15 to 49 years is drawn from the 1984 Census of Shewa region, which is part of the national population and Housing census of Ethiopia. The sample consists of all the relevant socio-economic and demographic information of 80528 eligible women. The sampling design is a stratified simple random sample and the unit of selection is the individual woman. Comparisons of some of the socio-economic and demographic characteristics of the women in the sample with that of the total women of child bearing ages in the region show that the sample is a good representative of the population. The main findings of the study, their policy implication as well as recommendation for future studies, have been summarized and presented in the following sections.

6.2 Level of Fertility

6.2.1 Reported

The reported CBR for the entire Shewa is 35.3 per thousand population. The corresponding figures for urban and rural areas of the region are 25.6 and 36.4 , respectively. TFRs of 6.15, 4.20 and 6.37 children per woman are found for the total, urban and rural areas of the region , respectively. Although the reported fertility rates are under-estimated to a certain extent, all suggest that the level of fertility in the region is high. The rates also implied higher rural than urban fertility.

6.2.2 Estimated

Examination of the fertility data reveals that the data suffered from omission and under reporting errors, and that the reported fertility rates are under-estimated. There is, therefore, a need for the application of some indirect estimation techniques, which could account for the under-reporting of births to arrive at plausible fertility estimates. The techniques employed in the process of indirect estimation of fertility are the P/F ratio method and the relational Gompertz model. In fact both methods resulted in almost comparable levels of fertility estimates in the region and in both urban and rural areas.

The estimated fertility measures are appraised and compared with the corresponding estimates from other sources and found to be plausible. However, in view of the errors in the reported age and fertility data, the fertility indices for the entire Shewa and for rural areas are taken in terms of ranges of estimates. Accordingly, for the total Shewa, the level of fertility ranges from a CBR of 41.8 to 44.4, and a TFR of 7.36 to 7.67. In urban areas, however, the estimates by the relational Gompertz model are considered as plausible. That is, a CBR of 38.7 and TFR of 6.35.

Indeed, the levels of fertility implied by all the estimated rates in the region as well as in both urban and rural areas are quite high. The level of fertility is however, higher in rural than urban areas. The persistently high level of fertility in the region could be attributed, among other things, to customs, beliefs and traditions favoring high fertility pattern, universal and early marriage, low status of women, high infant/child mortality, relatively low level of infertility and absence of any deliberate birth control. The same is ipso facto true in the case of urban and rural areas of the region.

6.3 Fertility Differentials

The analysis of fertility differentials focussed on nine socio-economic variables, namely, province of residence, urban-rural residence, education, economic activity, occupation,

migration status, marital status, religion and ethnicity. The analysis utilize the mean CEB as dependent variable and the socio-economic variables as independent variables, and is made for entire Shewa as well as for both urban and rural areas of the region. Moreover, in most cases, education is used as a control variable. Direct standardization is employed to control for the differences in the age composition of the women.

The analysis by province of residence shows the existence of fertility differentials among the Awrajas of Shewa. Accordingly, the highest fertility is found for Kembata and Hadiya, followed by Haikoch and Butagira and Jibat and Mecha Awrajas, in that order. The lowest fertility , on the other hand, is exhibited in Tegulet and Bulga Awraja. The observed fertility differences are attributed, among other things, to differences in ethnic composition and variation in the incidence of infertility among the Awrajas. It is observed that Awrajas with relatively higher fertility had low level of infertility and vise versa.

Evidence from this study indicates higher rural than urban fertility. This result is found using both the current and life time fertility data. The study attempts to explain the differentials in terms of differences in other factors such as age at first marriage, infant/child mortality and incidence of infertility between urban and rural areas.

Regarding fertility and education, an overall pattern of decreasing fertility with increasing educational level is evidenced in the region as well as in both urban and rural areas.

Fertility is higher among the illiterates than those who read and write or those with some years of formal schooling. The magnitude of the differentials are not however, substantial as expected. The difference between the fertility of illiterates and those who had formal education could be explained in terms of differences in age at marriage and other related factors. The fertility difference between the illiterates and those who read and write, on the other hand, might be attributed to differences in social and cultural practices of post-partum abstinence and prolonged breast feeding, but not to literacy per se.

Fertility differentials between the women in the labor force and not in the labor force, i.e active and inactive women, respectively, are examined both in urban and rural areas as well as in the entire region. The results show lower fertility among the active women and relatively higher fertility among those of inactive. The same pattern is observed in urban and rural areas and even after controlling for educational attainment of the women. The differentials are, however, found to be small. This weak association between fertility and economic activity might be due to the classification of women having varying occupational status into active category. Moreover, as the majority of the active women are engaged in farm work, which does not necessarily take away a woman far from her home, one may not expect a considerable incompatibility between the roles of mother and worker and hence substantially lower fertility among the active than inactive women.

The relationship between occupational status of women and fertility is considered in the study. Accordingly it is found, as predicted, that fertility is relatively lower among the women who are engaged in non agricultural occupation and higher among those engaged in agriculture. This pattern also emerges in both urban and rural areas and even after controlling for the educational attainment of the women. In fact, the fertility differentials between the women in the non agricultural and agricultural occupations are larger when the women had some years of formal schooling. The observed fertility differentials might be due to differences in intermediate factors such as age at first marriage and also to variations in the level of childlessness between these two groups of women.

Regarding migration and fertility, the data examined indicate relatively higher migrant than non-migrant fertility in the total and rural areas; but lower migrant than non-migrant fertility in urban areas. However, when the data are examined by duration of continuous residence, non-migrants appear to have higher fertility than those migrants who stayed for less than 6 years and 6 to 9 years, but lower than those who stayed for ten or more years. The same results are found when both place of residence and education are used as control variables.

A further analysis of data on fertility by identifying forms of migration shows higher fertility for women who moved from rural to rural areas, followed by those who moved from urban to rural, urban to urban and rural to urban areas. These findings suggest

that it is not only the origin but also the destination of migrants which affect the fertility - migration relationship. In short, the analysis of fertility by migration generally validate the migrant/non-migrant fertility differentials and provides evidence of higher fertility among the migrants who migrated from rural to rural areas and who stayed at their destination for ten or more years prior to the census date relative to natives.

Fertility differentials by current marital status is examined in the region and in both urban and rural areas. The reported mean CEB in some of the age groups reveal higher fertility among widowed women than those of currently married , divorced /separated or never-married. The standardized mean CEB, on the other hand, shows as expected, that the currently married women have higher fertility than other women. This pattern is also observed in both urban and rural areas and when adjustment is made for the effect of education. It should, however, be noted that the range in differentials between the fertility of currently married and widowed women is small. This might be due to the widowed who are likely to be older women and had mostly completed their fertility before the death of their husband.

Considering religion and fertility, the analysis indicates on the whole, that Protestants have higher fertility than Catholics, Catholics have higher fertility than Muslims, and Muslims have higher fertility than Orthodox Christians. In rural areas, the same pattern of relationship between religion and fertility is observed. In urban areas, nevertheless, Muslims are

found to have the highest fertility, followed by Catholics and Orthodox respondents in that order. The relatively higher fertility among the Protestants in the entire region and in rural areas, as discussed earlier is not because they are essentially more pro-natalist than the other religious groups, but it is probably due to other factors such as early age at marriage and low incidence of infertility. The higher fertility among the Muslims in urban areas, on the other hand, might be a reflection of the general global trend of high fertility for Muslim population. Similar findings are also found in Ethiopia [OPHCC, 1987] and other African counties [UN, 1973:105].

Ethnicity is noted to have an association with fertility in the region as well as in urban and rural areas. In total Shewa and rural areas of the region, the Welayitas appear to have the highest fertility, followed by the Hadiyas, Kembatas and Oromos in that order. On the other hand, the Gurages in urban areas have the highest fertility; the Kembatas and Welayitas have the second and third highest fertility , respectively. Indeed, in all cases, the lowest fertility is observed among the Amaras. The study argues that differences in cultures, customs and traditions and also variation in the level of primary and secondary infertility among the ethnic groups might explain the observed fertility differentials.

In general, the overall findings of the fertility differential analysis supported our hypothesis regarding the relationships between socio-economic variables considered in the study and

fertility. Moreover, they are consistent with previous findings in the country and elsewhere.

6.4 Socio - Economic Factors Influencing Fertility

The purpose of the multivariate analysis is to determine the relative importance of each of the socio-economic variables included in the study in explaining variation in fertility. In attempt to carry out this objective, MCA technique is employed for the total Shewa, for urban and rural areas, and for each of the eleven Awrajas of the region separately. The predictor variables considered in the model are; province of residence urban-rural residence, education, occupation, migration/ duration of continuous residence, marital status, religion and ethnicity. Age of a woman at the time of the census is used as a covariate. Of all the variables studied, marital status found to be the one that is most strongly correlated with fertility and remained so when adjusted for the effects of the other predictors. This is also true in both urban and rural areas as well as in most of the provinces.

Although its independent effect is reduced when the other predictors and age are allowed for education had a strong negative relationship with fertility in the total sample and also in all the sub-samples. Education of women, especially beyond primary level, can go a long way in lowering fertility through its direct effect on age at first marriage, attitudes towards

knowledge and use of contraception, and status and roles of women in decision making in reproduction.

Migration/duration of continuous residence is found to have a strong association, only next to marital status, with fertility in the total Shewa, in the urban and rural areas and in most of the Awrajas of the region. Fertility is positively related with duration of continuous residence of the migrants and this pattern remained so when adjustment is made for the other independent variables. The magnitude of the effect this variable is, however, decreased while controlling for the other predictors and covariate age.

Occupation and place of residence have negative but weak effect on fertility. This weak association between fertility and occupational status of women suggest that the theoretical assumption of incompatibility between roles of mother and worker is not strictly applicable in the region, as the majority of the women are engaged in activities which do not necessarily take away a woman far from her home. Moreover, even those women who are engaged in modern or non-agricultural occupations could have mother-substitutes who can help them in looking after children and other domestic chores. The weak relationship between residence status and fertility might have arisen as a result of the little or no difference between urban and rural areas of the region in terms of social and economic factors.

Province of residence, religion and ethnicity have varying effects on fertility. Province of residence had relatively strong

association with fertility in the entire region and in both urban and rural areas. Indeed, the effect of this variable is stronger than some of the other predictors, especially when the independent variables are held constant. Religion show slight effect on fertility as indicated by its eta and beta values. Ethnicity has also a considerable effect on fertility. Generally, among the selected predictor variables, marital status, province of residence, migration and ethnicity are the four most important factors accounting for the greatest proportion of the variance in fertility, as suggested by their beta values. Education, occupation, urban/rural residence, and religion are also important, but to a lesser extent.

6.5 Policy Implication

From what has been discussed so far, it is noted that customs, beliefs and traditions favoring high fertility patterns, universal and early marriages, low status of women, high infant and child mortality, and absence of any modern birth control methods are some of the factors responsible for the observed high level of fertility in the region and hence require a serious attention in the journey of curtailing the birth rate and thereby lowering the rate of population growth in Ethiopia. There is also evidence of a positive association between fertility and marital status, negative association between fertility and education; fertility and occupation, and fertility and residence

status. The implications of these findings are decreasing the proportion of married by raising the legal age at marriage,improving educational and occupational status of women, decreasing infant/child mortality, wider diffusion of contraception, and changing the customs, beliefs and traditions which favor large family size norms would lead to successful reduction in fertility.

Regarding the age at first marriage for girls, the government of Ethiopia has the intention of postponing the age at marriage to 18 years [ONCCP, 1988]. However, several studies conducted in other parts of the world showed that raising the age at marriage to 18 or 19 years is likely to have little or no effect in terms of fertility regulation, all other things being equal [see Alemseghed 1989:87-89]. We, therefore, suggest that, in order to curtail the birth rate adequately, the age of marriage for girls should be postponed to at least 20 years.

Evidence from this study and other sources indicated that the prevalence of modern contraceptive use is negligible in the region. Accordingly, the expansion of a nation wide family planning programme focussing on educating people on the dangers and risks of high fertility, disseminating information on the most effective and safe methods of birth control and making the methods accessible to people is an important undertaking which can no longer be postponed.

The low level of education of women is noted as one of the factors related to the high fertility patterns in the country.

Thus in order to improve the educational status of women, it would be appropriate as a policy measure to provide compulsory and free educational opportunities for young women up to secondary level. This might indirectly raise age at first marriage for girls, change attitudes towards knowledge and use of contraception and thereby reduce fertility.

As indicated earlier, participation of women in gainful activity would permit them to attain higher occupational status and thereby to curtail their fertility. Therefore, raising of occupational status of women by providing employment opportunities outside the home appears crucial in order to curb the prevailing high level of fertility in the country.

The low level of urbanization is also noted as one of the factors explaining the high level of fertility in the region. Attempts must, therefore, be made to facilitate and increase the pace of urban development. The reduction in the level infant/child mortality is known to increase the birth interval and hence reduce the level of fertility. There is, therefore, a crying need to improve the health conditions of the population and thereby reducing mortality in general and infant and child mortality in particular. There is also a need for a persistent derive against those social customs, beliefs and traditions which favor high fertility patterns in Ethiopia.

Finally, the prevalence of infertility and sub-fertility particularly in urban areas, in some Awrajas and among different ethnic groups needs special attention. Infertility, both primary

and secondary, as argued by Abate and Morgan [1986], has the impact of both increasing and decreasing fertility. In the short run, reducing infertility may result in higher fertility; it,however, encourages lower levels of child bearing in the long run. Thus, considering its negative effect on fertility in the future, emphasis must be given by the concerned agencies to study the problem and necessary measures should be taken to combat the problem.

6.6 The Need For Further Research On Fertility

To-date, no in-depth and systematic national studies on fertility levels, differentials and correlates are undertaken in Ethiopia. The existing studies covered only limited areas of the country and used data from small samples. Indeed, the present study is the first of its kind in utilizing such a sufficiently large sample. Nevertheless, because of the limited number of variables in the census questionnaire and above all because of the quality of the data, the study could not give adequate answer for the questions regarding the relationships between socio-economic factors and fertility in the country. Thus, it is of paramount importance to carry out a detailed study of this nature that will cover the entire population of the country in general and that of the sub-groups such as the urbanites, the different ethnic and religious groups, the working and non-working groups, the different educational groups, etc., in particular.

Moreover, the results of the multivariate analysis suggest that the socio-economic factors included in the model explain less than 40 per cent of the variations in fertility. Therefore, more research has to be done to identify those factors that are more direct or proximate to fertility, such as demographic and biological factors.

Furthermore, for those variables where a clear fertility differential has been observed even after controlling the effect of other predictors, it is recommended to examine the influence of these variables on fertility.

Finally, it is recommended that research has to be done in the etiology of infertility and its fertility implications in parts of the country.

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GLOSSARY

Age Specific Birth Rate (ASBR) - Ratios of births by age of mothers to women in each age interval, usually 5 years age interval.

Correlates of Fertility - Social, Economic, Cultural and Demographic factors which affect the level of fertility in a given population.

Crude Birth Rate (CBR) - The total number of births occurring per 1000 population in a given year.

Family Size - Refers to the total number of children a woman has borne at point in time during her reproductive years.

Fertility - Refers to the actual birth performance of a woman or a group of women.

Fertility Differentials - Study of systematic variations in the level of fertility within or between populations.

Forms of Migration: Movements of people between and within rural and urban areas. This includes all migrations within Shewa Region and from other Regions of the country in to Shewa.

General Fertility Rate (GFR) - The total number of births occurring per 1000 women in the reproductive ages (15-49 Years) in a given year.

Gross Reproduction Rate (GRR) - The average number of daughters a woman would have of she experienced a given set of age specific birth rates through out her reproductive span.

Infant Mortality Rate - The number of infant deaths in a given year per 1000 live births during the year.

Migrants - All persons except those who have been living at the place of enumeration continuously since birth.

Natives (Non-migrant) - Those who have been enumerated in the area where they were born and/or living in the area continuously since birth.

Parity - The number of children previously born alive to a woman or a group of women.

Primary Infertility or Childlessness - The inability to bear any children as a result of inability either to conceive or to carry a pregnancy to term.

Secondary Infertility - The inability to have a child subsequent to an earlier birth after a reasonable long period of exposure.

Singulate Mean Age at Marriage - The mean age at first marriage among those who ever marry.

Total Fertility Rate (TFR) - The number of births a women would have if she experienced a given set of age specific birth rates through out her reproductive span.

Urban Center - It is defined as a locality with 2000 or more inhabitants. It also includes all administrative capitals (Regional, Awraja, and Wereda) and localities in which urban dwellers associations were established, irrespective of the population size.

APPENDIX I

El-Badry Correction For Data On CEB

During the collection and/or the processing data on fertility problem of misclassification of women of zero parity as women whose parity is not stated often arises. El-Badry [UN: 1983], proposed a method which estimates the true childless women and the true female population with known-parity, based on the equation:

$$NS(i) = \delta Z(i) + \beta$$

The data required for this method are:

(a) Number of women in the zero-parity category (childless women) classified by five-year age groups.

(b) Number of women in the category "parity not stated" classified by five-year age groups.

(c) Total number of women classified by 5 years age groups.

SHEWA REGION

Age Group	Index	Number of Women Total FP(i)	Childless FZ(i)	Parity NS FNS(i)	Proportions Childless Z(i)	Parity NS NS(i)
15-19	1	14940	5012	6955	0.33548	0.46553
20-24	2	12118	1690	2558	0.13946	0.21109
25-29	3	13534	1040	1720	0.07684	0.12709
30-34	4	12812	712	1513	0.05557	0.11809
35-39	5	11465	583	1189	0.05085	0.10371
40-44	6	9399	465	1204	0.04947	0.12810
45-49	7	6260	382	835	0.06102	0.13339

URBAN SHEWA

15-19	1	2023	976	778	0.48245	0.38458
20-24	2	1205	323	204	0.26805	0.16929
25-29	3	1265	202	148	0.15968	0.11700
30-34	4	1273	155	125	0.12176	0.09819
35-39	5	1178	132	98	0.11205	0.08319
40-44	6	733	75	91	0.10232	0.12415
45-49	7	543	52	73	0.09576	0.13444

RURAL SHEWA

15-19	1	12917	4036	6177	0.31246	0.47821
20-24	2	10913	1367	2354	0.12526	0.21571
25-29	3	12269	838	1572	0.06830	0.12813
30-34	4	11539	557	1388	0.04827	0.12029
35-39	5	10287	451	1091	0.04384	0.10606
40-44	6	8666	390	1113	0.04500	0.12843
45-49	7	5717	330	762	0.05772	0.13329

Plotting the reported proportion of childless against the proportion with parity not stated gave approximately a straight line in both urban and rural areas. Therefore, it suggested the possibility of applying the method for correction purposes. The technique is applied for both urban and rural sub-samples.

Fitting a straight line using a group mean for sample population of Urban and Rural Shewa 1984.

Age Group	Z(i)	NS(i)	Z(i)	NS(i)
		(a) First Group		
15-19	0.48245	0.38458	0.31246	0.47821
20-24	0.26805	0.16929	0.12526	0.21571
25-29	0.15968	0.11700	0.06830	0.12813
Mean	Z_1=0.30339	NS_1=0.22362	Z_1=0.16867	NS_1=0.27402

(b) Second Group

25-29	0.15968	0.11700	0.06830	0.12813
30-34	0.12176	0.09819	0.04827	0.12029
35-39	0.11205	0.08319	0.04384	0.10606
Mean	Z_2=0.13116	NS_2=0.09946	Z_2=0.05347	NS_2=0.11816

We have

$$\delta = \frac{NS_2 - NS_1}{Z_2 - Z_1}$$

and

$$ß = NS_2 - \delta Z_2$$

The computed values of δ and ß are given below.

	Urban	Rural
δ	0.72090	1.35295
ß	0.00491	0.04582

Calculation of the true childless proportion:

$$Z^*(i) = Z(i) + NS(i) - ß$$

Calculation of Denominator for estimating average parities:

$$FP^*(i) = (1.0 - ß)\ FP(i)$$

Estimated Number of Childless Women and Women with known parity by Urban/Rural Areas, Shewa 1984.

Age Group	Index	Total		Urban		Rural	
		Childless	Women with Known Parity	Childless	Women with Known Parity	Childless	Women with Known Parity
15-19	1	11365	14338	1744	2013	9621	12325
20-24	2	3742	11612	521	1199	3221	10413
25-29	3	2192	12966	344	1259	1848	11707
30-34	4	1690	12277	274	1267	1416	11010
35-39	5	1295	10988	224	1172	1071	9816
40-44	6	1268	8998	162	729	1106	8269
45-49	7	952	5995	122	540	830	5455
Total		22504	77174	3391	8179	19113	68995

Note: The number of women in these two categories for the total Shewa are found by adding the corresponding figures in urban and rural areas.

To see the effect of excluding or including the non-stated women or using the adjusted (estimated) number of women with known parity, the average parities are estimated using three female population figures as shown below.

Comparison of Average parities using different reporting of parity; Shewa 1984.

Age	Rural			Urban			Total		
Group	1	2	3	1	2	3	1	2	3
15-19	0.339	0.649	0.355	0.209	0.340	0.210	0.321	0.601	0.335
20-24	1.558	1.987	1.633	1.285	1.546	1.291	1.531	1.941	1.598
25-29	2.666	3.056	2.794	2.329	2.637	2.340	2.634	3.018	2.750
30-34	3.624	4.120	3.799	3.294	3.652	3.309	3.592	4.073	3.748
35-39	4.365	4.882	4.574	3.911	4.266	3.931	4.318	4.818	4.505
40-44	4.601	5.279	4.822	4.007	4.575	4.029	4.555	5.224	4.758
45-49	4.643	5.357	4.866	3.972	4.589	3.994	4.585	5.290	4.787

Note: 1. Including parity not stated women
2. Excluding parity not stated women
3. Adjusted using EL-BADRY method.

Comparison of the above result revealed that the inclusion of the parity not-stated women as zero parity under-estimated the average parities, while the exclusion of this group of women inflated the figures considerably in the total region as well as in both urban and rural areas.

Due to this fact, estimation of the levels of fertility in Shewa and in urban and rural areas of the region is made based on the estimated number of women through the El-Badry method. To investigate fertility differentials, however, women who did not state their parity are excluded from the analysis. This is mainly because of the fact that the inclusion or exclusion of these women from the analysis neither change the direction of the differential nor reduce the magnitudes substantially.

APPENDIX II

Estimation of the Parameters 'm' and 'M' in Coale's Marital Fertility Schedule.

Given: $F(i) = Mh(i)\, e^{mv(i)}$

Where: f(i) denotes the marital fertility at the age group i.

h(i) is the natural fertility, as represented by the Hutterites, at the same age group.

V(i) is the typical pattern of deviation from the natural fertility when deliberate birth control is practiced.

M and m are the parameters to be determined and indicate the level of natural fertility and the degree to which birth control is practiced, respectively.

Then,

$$m = \frac{\ln\left(\frac{f(40)}{h(40)}\right) - \ln\left(\frac{f(25)}{h(25)}\right)}{V(40) - V(25)}$$

and

$$M = \frac{f(40)}{h(40)} e^{-mV(40)}$$

Where,

$$\ln\frac{f(40)}{h(40)} = \frac{\ln\frac{f(35-39)}{h(35-39)} + \ln\frac{f(40-44)}{h(40-44)}}{2}$$

$$V(40) = \frac{V(35-39)+V(40-44)}{2}$$

Similar procedure is followed for estimating

$$\ln\frac{f(25)}{h(25)}, V(25)$$

The computed values of 'M' and 'm' for the total Shewa as well as for the urban and rural areas are given below.

	Total	Urban	Rural
M	0.585	0.466	0.598
m	-0.122	0.031	-0.132

APPENDIX III

Unadjusted Age Specific Fertility Rates (ASFRs) By Urban/Rural Residence, Shewa 1984.

Age Group	Age Specific Fertility Rate		
	Total	Urban	Rural
15-19	0.0890	0.0477	0.0957
20-24	0.2416	0.1651	0.2505
25-29	0.2633	0.1898	0.2712
30-34	0.2338	0.1665	0.2415
35-39	0.2070	0.1408	0.2150
40-44	0.1210	0.0741	0.1252
45-49	0.0737	0.0556	0.0755
Total	1.2295	0.8396	1.2746

SoSource: Computed by the author from the sample.

APPENDIX IV

Unadjusted and Adjusted Deviations in Mean Number of Children Ever-born by predictor Variables, Shewa Awrajas, 1984.

Predictor Variable	Number of Women	Unadjusted Deviation	Eta	Adujsted Deviation	Beta
Chebo and Gurage (N = 10311)					
Residence Status			0.04		0.01
Urban	194	-0.80		-0.25	
Rural	10099	0.02		0.00	
Education			0.11		0.02
Illiterate	9859	0.06		0.01	
Read & Write	64	-0.20		-0.17	
Formal Schooling	370	-1.59		-0.93	
Occupation			0.05		0.06
No Occupation	5172	0.11		0.16	
Agricultural	4530	-0.06		0.10	
Non-Agricultural	591	-0.49		-0.17	
Migration			0.13		0.07
Non-Migrant	8555	-0.04		-0.01	
< 6 Years	787	-0.65		-0.40	
6 to 9 Years	125	-0.55		-0.16	
10+ Years	826	1.11		0.50	
Marital Status			0.33		0.14
Never Married	711	-3.23		-1.06	
Currently Married	8805	0.25		0.14	
Div / Sep	338	-1.07		-1.19	
Widowed	439	1.01		-0.22	
Religion			0.02		0.02
Orthodox	6295	0.03		0.01	
Protestant	3	-		-	
Catholic	10	0.33		0.65	
Muslim	3966	-0.05		-0.01	
Others	19	0.64		0.72	

Ethnicity			0.02		0.07
Amara	170	0.06		0.24	
Garage	6919	-0.04		-0.13	
Hadiya	16	0.53		0.11	
Oromo	3135	0.09		0.25	
Others	53	-0.03		0.63	
Grand Mean	3.74				
Adjusted Multiple R	0.578				
R^2	0.334				
Stat. Signifi.	0.00				

Hiakoch and Butagira (N = 11078)

Residence Status			0.03		0.02
Urban	1111	-0.29		-0.18	
Rural	9907	0.03		0.02	
Education			0.14		0.03
Illiterate	9786	0.15		0.02	
Read and Write	137	-0.94		-0.15	
Formal Schooling	1095	-1.21		-0.57	
Occupation			0.05		0.04
No Occupation	5860	0.19		0.06	
Agricultural	4309	-0.12		-0.09	
Non-Agricultural	849	0.14		-0.13	
Migration			0.23		0.10
Non-Migrant	6593	-0.14		-0.05	
< 6 Years	1091	-1.37		-0.68	
6 to 9 Year	519	-0.71		-0.21	
10+ Years	2815	0.93		0.42	
Marital Status			0.24		0.11
Never Married	490	-3.16		-1.12	
Currently Married	9623	0.14		0.13	
Div/Sep.	371	-0.56		-0.76	
Widowed	534	0.85		-0.74	

Religion			0.03	0.05
Orthodox	2127	-0.10	0.20	
Protestant	340	0.21	0.60	
Catholic	140	0.49	0.39	
Muslim	8346	0.01	-0.08	
Others	65	0.03	0.50	
Ethnicity			0.13	0.13
Alaba	810	-0.78	-0.68	
Amara	551	-0.56	-0.48	
Gurage	2218	-0.37	-0.42	
Hadiya	554	-0.14	-0.28	
Kembata	406	0.33	-0.10	
Oromo	5565	0.32	0.37	
Welayita	207	-0.39	-0.05	
Others	707	0.04	-0.16	
Grand Mean	3.85			
Adjusted Multiple R	0.558			
R^2	0.312			
Stat. Signifi.	0.00			

Jibat and Mecha (N = 5819)

Residence Status			0.04	0.01
Urban	420	-0.41	-0.11	
Rural	5379	0.03	-0.01	
Education			0.17	0.04
Illiterate	5117	0.14	0.03	
Read and Write	348	-0.25	-0.07	
Formal Schooling	334	-1.85	-0.39	
Occupation			0.08	0.01
No Occupation	850	-0.43	0.06	
Agricultural	4438	0.12	0.00	
Non-Agricultural	511	-0.35	-0.08	
Migration			0.12	0.08
Non-Migrant	4244	0.03	0.02	
< 6 Years	495	-0.91	-0.66	
6 to 9 Years	140	-0.85	-0.47	
10+ Years	920	0.48	0.41	

Marital Status			0.25		0.14
Never Married	263	-2.97		-1.13	
Currently Married	4873	0.22		0.16	
Div./Sep.	466	-0.83		-0.90	
Widowed	197	0.55		-0.26	
Religion			0.02		0.03
Orthodox	5686	0.00		-0.01	
Protestant	32	0.55		0.67	
Catholic	3	-		-	
Muslim	39	0.00		0.59	
Others	39	-0.38		0.11	
Ethnicity			0.04		0.03
Amara	246	0.15		0.41	
Gurage	104	-0.39		0.04	
Kembata	2	-		-	
Oromo	5411	0.01		-0.02	
Welayita	1	-		-	
Others	35	-0.75		-0.37	
Grand Mean	3.64				
Adjusted Multiple	R 0.536				
	R^2 0.287				
Stat. Signifi.	0.00				

<u>Kembata and Hadiya</u> (N = 10248)

Education			0.18		0.03
Illiterate	8646	0.19		0.03	
Read and Write	754	-0.28		-0.08	
Formal Schooling	836	-1.69		-0.28	
Occupation			0.07		0.07
No Occupation	6647	0.15		0.16	
Agricultural	3369	-0.26		-0.28	
Non-Agricultural	220	-0.71		-0.52	
Migration			0.16		0.07
Non-Migrant	8131	-0.11		-0.05	
< 6 Years	792	-0.54		-0.29	
6 to 9 Years	130	-0.91		-0.07	
10+ Years	1183	1.25		0.56	

Marital Status			0.33	0.13
Never Married	619	-3.74	-1.33	
Currently Married	9017	0.23	0.13	
Div./Sep.	180	-0.73	-0.95	
Widowed	420	0.97	-0.51	
Religion			0.09	0.08
Orthodox	2295	0.15	0.09	
Protestant	3553	0.24	0.21	
Catholic	825	-0.07	0.03	
Muslim	3327	-0.34	-0.31	
Others	236	-0.04	0.14	
Ethnicity			0.06	0.04
Alaba	509	-0.61	-0.17	
Amara	63	-0.42	-0.31	
Gurage	618	0.05	0.30	
Hadiya	4167	-0.08	0.06	
Kenbata	4200	0.11	-0.09	
Oromo	68	0.23	0.01	
Welayita	378	0.27	0.00	
Others	233	0.19	0.22	
Grand Mean	4.00			
Adjusted Multiple R	0.618			
R^2	0.382			
Stat. Signifi.	0.00			

Menagesha (N=5818)

Residence Status			0.23	0.07
Urban	1410	-1.18	-0.35	
Rural	4383	0.38	0.11	
Education			0.27	0.03
Illiterate	4320	0.45	0.05	
Read and Write	199	-0.30	-0.02	
Formal Schooling	1274	-1.48	-0.18	
Occupation			0.20	0.03
No Occupation	1044	0.44	0.15	
Agricultural	3738	-0.69	-0.01	
Non-Agricultural	1011	-0.91	-0.12	

Migration			0.28	0.10
Non-Migrant	3535	0.21	0.07	
< 6 Years	1024	-1.69	-0.51	
6 to 9 Years	298	-0.91	-0.40	
10+ Years	936	1.11	0.42	
Marital Status			0.44	0.19
Never Married	740	-3.18	-1.15	
Currently Married	4344	0.59	0.31	
Div./Sep.	472	-0.96	-1.04	
Widowed	237	1.05	-0.11	
Religion			0.08	0.02
Orthodox	5651	0.02	0.00	
Protestant	56	-2.03	-0.45	
Catholic	9	-2.46	-0.55	
Muslim	64	0.41	0.29	
Others	13	-1.74	-0.38	
Ethnicity			0.16	0.03
Amara	1428	-0.67	0.08	
Gurage	131	0.57	0.48	
Hadiya	11	-1.54	0.10	
Kembata	1	-	-	
Oromo	4071	0.27	-0.04	
Welayita	7	0.79	0.45	
Others	144	-1.50	-0.44	

Grand Mean		3.35
Adjusted Multiple	R	0.641
	R^2	0.411
Stat. Signifi.		0.00

Mens and Gishe (N = 2365)

Residence Status			0.01	0.06
Urban	86	-0.01	-0.03	
Rural	2278	0.17	0.70	
Education			0.18	0.07
Illiterate	2094	0.15	0.06	
Read and Write	145	-0.97	-0.37	
Formal Schooling	125	-1.33	-0.59	

Occupation			0.05		0.08
No Occupation	737	0.13		0.20	
Agricultural	1488	-0.03		-0.05	
Non-Agricultural	139	-0.35		-0.59	
Migration			0.06		0.03
Non-Migrant	2132	-0.01		0.00	
< 6 Years	129	-0.15		-0.07	
6 to 9 Years	32	-0.52		-0.35	
10+ Years	71	0.77		0.35	
Marital Status			0.28		0.17
Never Married	151	-2.20		-1.04	
Currently Married	1844	0.23		0.18	
Div/Sep.	313	-0.52		-0.63	
Widowed	56	1.43		0.50	
Religion			0.07		0.06
Orthodox	1762	0.07		0.07	
Protestant	12	-1.07		-0.79	
Muslim	419	-0.07		-0.11	
Others	171	-0.51		-0.39	
Ethnicity			0.05		0.02
Amara	2249	0.01		0.00	
Gurage	2	-		-	
Oromo	88	0.02		-0.04	
Others	25	-1.05		-0.14	

Grand Mean	2.74
Adjusted Multiple R	0.521
R^2	0.272
Stat. Signifi.	0.00

Merhabete (N=2071)

Residence Status			0.00		0.01
Urban	127	-0.02		-0.06	
Rural	1943	0.00		0.01	

Education			0.18		0.04
Illiterate	1647	0.22		0.05	
Read and Write	237	-0.49		-0.06	
Formal Schooling	186	-1.33		-0.34	
Occupation			0.20		0.15
No Occupation	475	0.97		0.71	
Agricultural	1492	-0.13		0.06	
Non-Agricultural	103	-0.30		-0.23	
Migration			0.11		0.05
Non-Migrant	1727	-0.01		0.00	
< 6 Years	156	-0.09		-0.30	
6 to 9 Years	37	-0.24		0.00	
10+ Years	150	1.07		0.35	
Marital Status			0.28		0.19
Never Married	80	-2.98		-1.50	
Currently Married	1674	0.25		0.24	
Div./Sep	246	-1.08		-1.05	
Widowed	70	1.09		-0.24	
Religion			0.04		0.11
Orthodox	1630	0.06		0.14	
Muslim	436	-0.21		-0.54	
Others	4	-		-	
Ethnicity			0.10		0.10
Amara	1939	-0.07		-0.07	
Oromo	122	1.08		1.04	
Others	9	-0.46		-0.07	

Grand Mean	3.24
Adjusted Multiple R	0.565
R^2	0.319
Stat. Signifi.	0.00

Selale (N=4217)

Residence Status			0.06		0.05
Urban	299	-0.04		-0.04	
Rural	3909	0.56		0.52	

Education			0.05	0.03
Illiterate	3931	0.50	0.02	
Read and Write	103	0.01	0.01	
Formal Schooling	174	-0.48	-0.25	
Occupation			0.09	0.06
No Occupation	473	0.07	0.07	
Agricultural	3556	-0.31	-0.26	
Non-Agricultural	179	-0.54	-0.44	
Migration			0.10	0.04
Non-migrant	3758	-0.04	-0.02	
< 6 Years	193	-0.49	-0.11	
6 to 9 Years	54	-0.09	-0.26	
10+ Years	203	1.15	0.46	
Marital Status			0.24	0.18
Never Married	161	-2.78	-1.00	
Currently Married	3548	0.22	0.21	
Div./Sep.	332	-1.04	-1.11	
Widowed	167	0.10	-1.29	
Religion			0.02	0.01
Orthodox	4116	0.00	0.00	
Protestant	1	-	-	
Muslim	90	-0.12	-0.02	
Others	1	-	-	
Ethnicity			0.07	0.07
Amara	1398	0.27	0.26	
Oromo	2791	-0.14	-0.13	
Others	19	-0.07	0.03	

Grand Mean	3.33
Adjusted Multiple R	0.571
R^2	0.326
Stat. Signifi.	0.00

Tegulet and Bulga (N = 4466)

Residence Status			0.08	0.00
Urban	468	-0.61	-0.02	
Rural	3975	0.07	0.00	

Education			0.16		0.02
Illiterate	3566	0.18		0.03	
Read and Write	356	-0.25		-0.12	
Formal Schooling	521	-1.09		-0.11	
Occupation			0.09		0.07
No Occupation	897	0.26		0.35	
Agricultural	3243	0.00		-0.03	
Non-Agricultural	303	-0.78		-0.09	
Migration			0.12		0.05
Non-Migrant	3558	-0.01		0.09	
< 6 Years	297	-0.94		-0.50	
6 to 9 Years	97	-0.08		0.02	
10+ Years	491	0.59		0.19	
Marital Status			0.32		0.16
Never Married	459	-2.34		-0.93	
Currently Married	3495	0.32		0.19	
Div./Sep.	394	-0.47		-0.74	
Widowed	95	1.51		0.16	
Religion			0.06		0.06
Orthodox	4372	-0.01		-0.02	
Protestant	6	-1.64		-1.64	
Catholic	2	-		-	
Muslim	60	1.11		1.20	
Others	3	-		-	
Ethnicity			0.02		0.01
Amara	4398	0.00		0.00	
Gurage	1	-		-	
Oromo	23	-0.54		-0.31	
Others	21	-0.38		-0.22	

Grand Mean	2.81
Adjusted Multiple R	0.533
R^2	0.284
Stat. Signifi.	0.00

Yerer and Kereyu (N = 5445)

Residence Status			0.14		0.06
Urban	2189	-0.47		-0.20	
Rural	3209	0.32		0.14	

Education			0.21		0.02
Illiterate	3525	0.40		0.04	
Read and Write	237	-0.04		-0.06	
Formal Schooling	1636	-0.86		-0.08	
Occupation			0.16		0.03
No Occupation	1690	0.53		0.10	
Agricultural	1992	-0.10		-0.01	
Non-Agricultural	1716	-0.51		-0.08	
Migration			0.31		0.14
Non-Migrant	1551	0.38		0.01	
< 6 Years	1464	-1.26		-0.50	
6 to 9 Years	767	-0.33		-0.10	
10+ Years	1616	0.93		0.49	
Marital Status			0.32		0.17
Never Married	426	-2.72		-1.00	
Currently Married	4145	0.33		0.25	
Div./Sep.	566	-0.77		-0.84	
Widowed	261	0.85		-0.50	
Religion			0.02		0.03
Orthodox	4058	0.01		-0.02	
protestant	276	-0.12		0.34	
Catholic	145	-0.21		0.13	
Muslim	882	0.02		-0.01	
Others	37	-0.16		-0.37	
Ethnicity			0.11		0.03
Alaba	1	-		-	
Amara	1686	-0.17		-0.06	
Gurage	230	-0.31		0.26	
Hadiya	272	-0.18		0.04	
Kembata	440	-0.25		0.13	
Oromo	2199	0.35		-0.02	
Welayita	219	-0.68		0.11	
Others	351	-0.25		-0.07	

Grand Mean	3.16
Adjusted Multiple R	0.569
R^2	0.323
Stat. Signifi.	0.00

Yifat and Tinuga (N = 2716)

Residence Status			0.03		0.02
Urban	322	-0.25		-0.17	
Rural	2371	0.03		0.02	
Education			0.12		0.01
Illiterate	2468	0.10		0.01	
Read and Write	100	-0.82		-0.11	
Formal Schooling	125	-1.34		-0.14	
Occupation			0.04		0.03
No Occupation	1420	0.09		0.06	
Agricultural	1019	-0.06		0.02	
Non-Agricultural	254	-0.23		-0.10	
Migration			0.13		0.06
Non-Migrant	1951	0.02		0.05	
< 6 Years	206	-0.96		-0.50	
6 to 9 Years	151	-0.45		-0.29	
10+ Years	385	0.57		0.10	
Marital Status			0.33		0.19
Never Married	189	-3.02		-1.27	
Currently Married	2183	0.34		0.25	
Div./Sep.	240	-0.90		-1.00	
Widowed	81	0.58		-0.80	
Religion			0.04		0.04
Orthodox	1414	0.08		0.08	
Protestant	1	-		-	
Catholic	1	-		-	
Muslim	1275	-0.09		-0.10	
Others	2	-		-	
Ethnicity			0.06		0.08
Amara	1673	0.02		-0.08	
Gurage	2	-		-	
Kembata	1	-		-	
Oromo	808	0.10		0.29	
Others	209	-0.56		-0.50	

Grand Mean	3.35
Adjusted Multiple R	0.612
R^2	0.375
Stat. Signifi.	0.00

D E C L A R A T I O N

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

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Signature: B. Berhanu.

Place and Date of submission: Addis Ababa, October 1991