

EDUCATION, PROXIMATE DETERMINANTS AND
FERTILITY LEVELS IN BANGLADESH

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DECLARATION

Except where otherwise indicated
this thesis is my own work.



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ABSTRACT

This study investigates the effect of education, particularly the individual and the regional level of education, on fertility in Bangladesh, based on a subset of data from the Bangladesh Fertility Survey (BFS) and the Household Survey conducted during 1975-76. The study examines effect of education on the proximate determinants of fertility, namely marriage, postpartum non-susceptibility to conception and contraception and their combined effect on overall fertility levels in education subgroups and areas. Bangladesh has been grouped into High, Moderate, Low and Lowest Education Areas based on the proportion of women with No Schooling.

This study has been divided into five chapters. Chapter 1 discusses the aims, scope and importance of the study, the source of data, and background information on the study population. Chapter 2 reviews the relevant literature, while Chapters 3 and 4 analyse the effect of individual and regional levels of education respectively. The Bongaarts model is used to quantify the contribution of proximate determinants of fertility and to determine the effect of education at both these levels.

As shown in Chapter 3, a small amount of education tends to increase fertility at the individual level. However, those with higher education have the lowest fertility. At the regional level the effect of education is different, with overall fertility of the area falling as the proportion of educated women in the area increases. Some effect of the community level of education is evident for uneducated women living in a High Education Area.

The contribution of the duration of postpartum non-susceptibility is stronger for less educated women and in areas where the overall level of education is lower, while marriage patterns and contraceptive use

have important effects when education is high at both the individual and regional levels. Thus, an understanding of the effect of education on fertility at both the individual and regional level is important when population policies to reduce fertility levels are formulated.

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CHAPTER 1

THE AIMS, SCOPE AND IMPORTANCE OF THE STUDY, SOURCES OF DATA AND THE BACKGROUND INFORMATION OF THE POPULATION

1.1 INTRODUCTION

Fertility and its determinants have become vital topics for research in recent decades with the rapid expansion of the world population. Yet, there is no commonly accepted framework for fertility analysis that provides a comprehensive understanding of the determinants that affect fertility and the relationships among these determinants (Mauldin, 1981: 1). Throughout past decades interest has been growing and much research has been done on interpreting the socio-economic factors that cause declines in fertility during the process of economic and social development, and in devising policies that might equip these factors to accelerate the decline. Among the factors emphasized as important, and also traceable to policy manipulation, is education (Cochrane, 1979: 1).

Education is one of the most modern demographic variables, which unlike sex and age is not a biological characteristic but a social attribute. It is a particular type of socialization that usually takes place outside the home (Hull and Achanfuo-Yeboah, 1985: 183). Education is also considered a crucial variable in explaining differences in nuptiality and fertility behaviour and differential patterns of mortality and migration. Demographers see education as a crucial variable which sometimes provides the key to the understanding of differentials as well as changing demographic behaviour (Musham, 1969: 1869).

Education itself is a complex variable. It is often used as a proxy

measure for many other variables. For example, education is considered as a proxy measure of housewife's time and a measure of formation of taste and preferences of socio-economic status (Leibenstein, 1977: 457-461). It is also used as a proxy index of awareness of family planning (Stycos, 1965: 177-180). Caldwell (1979) in contrast argued that female (maternal) education must be examined as an important force in its own right.

However, education enhances changes in the economic, social, psychological and cultural atmosphere of individuals as well as the society as a whole. Education provides opportunities for personal advancement, creates aspirations of upwards social mobility and also provides a new outlook beyond tradition, willingness to analyse institutional values and patterns of behaviour and growth of rationalism (Dandekar, 1965: 146-149). Education is a route to secure well paid employment and as a result raises the standard of living. It also enhances the likelihood of female employment. Moreover, education provides better knowledge of health and nutrition and changes traditional attitudes towards food and health related issues. However, developed countries' experience tends to indicate how important education was for achieving development goals in all aspects of social and economic life. This indicates that education is a potent instrument for economic and social development, as well as demographic changes, particularly in developing countries.

1.2 AIMS AND SCOPE OF THE STUDY

The high growth rate of population in Bangladesh has been posing a serious threat to its social and economic development. The Government of Bangladesh (Planning Commission, 1980: xvii-27) recognises that if the present rate of population growth of 2.7 per cent is sustained, then all development efforts will be frustrated, aggravating the already unfavourable economic conditions. It is also recognised that high fertility is mainly responsible for the high rate of growth. Recently, attempts have been made to understand the socio-economic variables that operate through the intermediate variables or proximate determinants,

resulting in such high fertility in Bangladesh. This study aims to find the contribution of the various proximate determinants to the level of fertility among different education groups and education areas in Bangladesh. The specific aims are as follows:

(1) To study the patterns of proportions married among all women and the levels of contraception, induced abortion and postpartum non-susceptibility among ever married women according to:

- (a) the individual level of education
- and (b) the regional level of education.

(2) To compare the contribution of these variables to overall fertility using the Bongaarts model of proximate determinants of fertility at the individual level and at the regional level of education.

(3) To examine the extent of variation in selected proximate determinants of fertility among education groups and regions and to estimate their combined effect on total fertility.

The following hypotheses will be tested:

(1) An individual's education directly affects her own fertility. For example, fertility of women with primary education would be different from that of women with no education.

(2) The overall educational profile of an area will have an effect on an individual's fertility irrespective of her own education, e.g the fertility of women with no education living in an area with a high proportion of educated women would be different from that of women with no education living in an area with a lower proportion educated.

1.3 IMPORTANCE OF THE STUDY

Education has occupied an important place in investigative work, both of levels and differentials of fertility by socio-economic status and of causal explanations of fertility changes (United Nations, 1983: 1). Since education is a policy variable, which is related with several aspects of fertility behaviour, knowledge about the relationship between education and fertility is relevant for developing and less developed countries in the context of their development planning. In Bangladesh, where high fertility is considered an obstacle to growth, detailed knowledge of the education-fertility relationship might facilitate decisions concerning educational levels and content, the structure of the educational system and the distribution of resources between education and other competing programmes. The present study looks at some proximate determinants of fertility for different educational sub-groups and geographical areas, based on the BFS data, and using the Bongaarts model. This thesis will make an important contribution as the first comprehensive application of the Bongaarts framework to the study of educational differentials in Bangladesh.

1.3.1 SOURCE OF DATA

This study is based on the primary analysis of three subsets of data, two obtained from the Bangladesh Fertility Survey (BFS) and one obtained from Household Survey Data collected between 1975-76 with the joint collaboration of the Ministry of Health, Population Control and Family Planning of the Government of Bangladesh and the International Statistical Institute, the Hague.

1.3.2 METHODOLOGY OF BFS

Bangladesh, as a participant in the World Fertility Survey (WFS) followed the core questionnaire prepared for developing countries after adopting some necessary changes. Although the specific aims and objectives of the BFS have been discussed in detail in the First Report (WFS, 1978: 20-35), some of those which are related to this study are discussed briefly in the next sections. These are, the sample design, sample size and the selection criteria for the respondents.

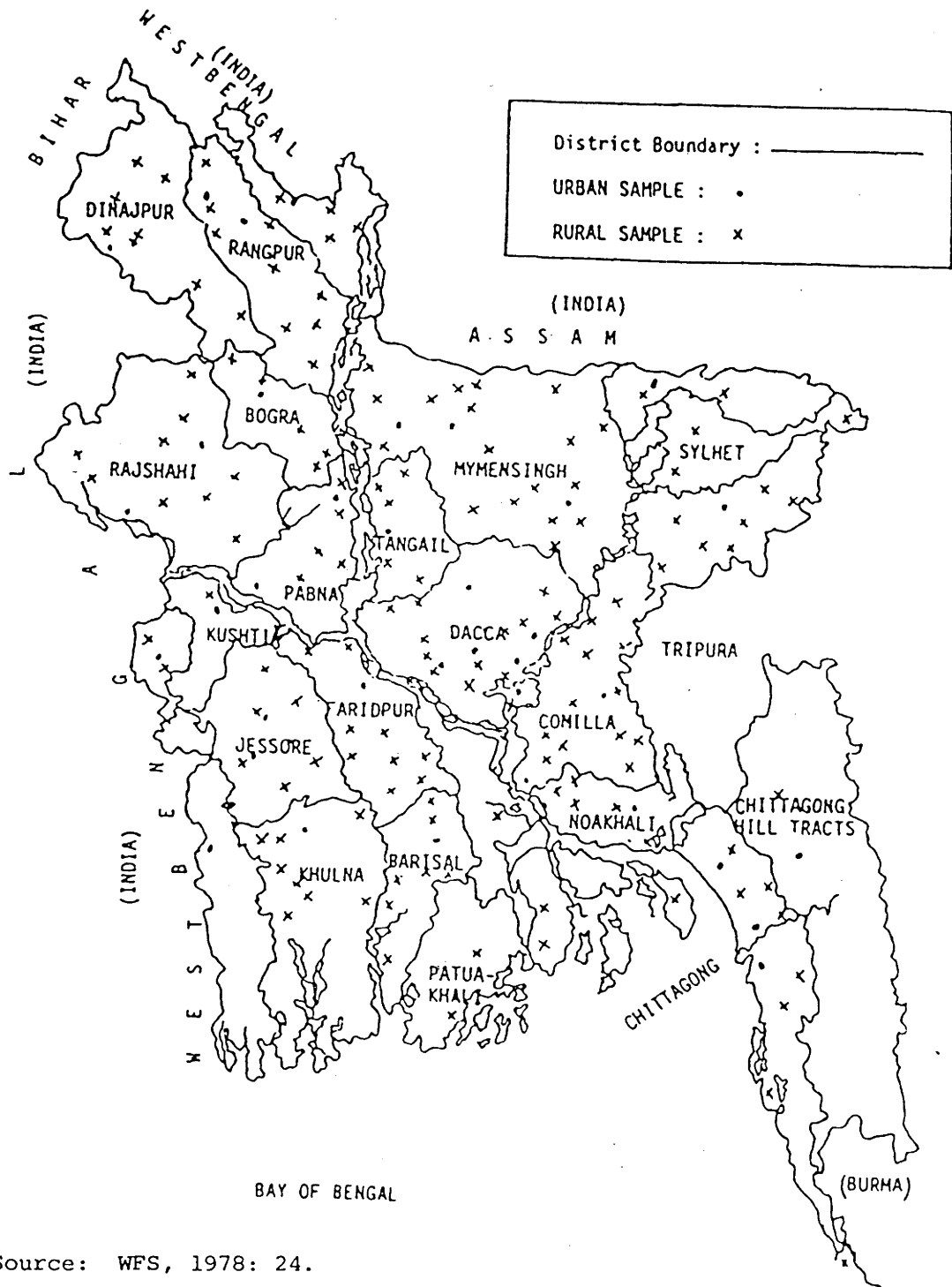
1.3.3 SAMPLE DESIGN AND SAMPLE SIZE

Following the recommendations contained in the WFS protocol, Bangladesh adopted a three stage sample design for the urban and rural strata. The first two stages were area selection, done with probability proportional to size of population. The third stage was done by probability inversely proportional to the number of households. This selection procedure made the sample self-weighting within each stratum, urban and rural. The sampling frame for the first two stages, the area selection, were provided by the 1974 national population census and the frame for the ultimate stage was prepared on the basis of field visits. A total of 6145 households were selected out of which 4626 were rural and 1519 urban. In all 4437 households in rural and 1418 households in urban area were successfully interviewed giving a 4.7 per cent non-response rate for the whole sample (WFS, 1978: 20-31). The distribution of the 240 sample villages/blocks (160 from rural and 80 from urban) from which the households were selected are shown in map (Figure 1-1).

1.3.4 SELECTION OF ELIGIBLE RESPONDENTS

The criteria for selecting eligible respondents was a representative sample of ever married women who were in the reproductive period, in other words, aged below 50 years and who slept in the household on the night preceding the survey. Thus the survey was conducted on a de-facto basis. The de-facto criteria was followed to avoid getting usual members who were absent at the time of the survey and visitors were interviewed because it was assumed that visitors would replace absentee household members. A total of 5123 (unweighted) in rural and 1489 (unweighted) in urban areas were interviewed as eligible respondents. The non-response rate in rural and urban areas were 1.9 and 2.4 per cent respectively (WFS, 1978: 20-31).

Figure 1-1: BANGLADESH FERTILITY SURVEY: SCATTER OF SAMPLE POINTS



1.3.5 DATA OBTAINED FOR THIS STUDY

Since the present study is based on the Bongaarts model of proximate determinants of fertility, so the information on these variables such as proportions of women currently married, marital fertility, contraceptive use, abortion rate and postpartum non-susceptibility have been obtained from the BFS data. These variables are the basis of the estimates of the indices of Bongaarts model. The socio-economic variables which related with these indices are taken from the following sections of the individual questionnaires of BFS: Section 1-Respondents Background , Section 2-Marriage History , Section 4-Knowledge and Use of Contraception and Section 5- Fertility Regulation. The key questions related to the indices are reproduce in an appendix.

1.4 THE SOCIO-ECONOMIC AND THE DEMOGRAPHIC BACKGROUND OF THE POPULATION

1.4.1 THE HISTORICAL BACKGROUND AND GEOGRAPHICAL SETTING.

Bangladesh became a sovereign state in 1971. Although it is a new nation, the country and its people have had a thousand years of history. The area constituting Bangladesh was under Muslim rule for about five and a half centuries and passed into British hands in 1757. During the British rule the country was part of the British Indian provinces of Bengal and Assam. With the termination of British rule in 1947, it constituted the eastern wing of Pakistan and was known as East Pakistan. It remained with Pakistan until secession in 1971. Bangladesh suffered disadvantages under the British rule and Pakistanis and were deprived from getting the facilities of health, education and so on. Also the civil war in 1971 caused greater disruption, the loss of a large proportion of educated members of the population, and widespread destruction, all of which have inhibited development in Bangladesh.

Bangladesh lies in the north eastern part of South Asia. It is bounded by India in the west and north, India and Burma on the east and the Bay of Bengal to the south. With the exception of the hilly areas in

the southeast and the northeast, most of the country is less than 15 metres (50 feet) above the sea levels (Ahmed, 1968:21). Bangladesh enjoys a sub-tropical monsoon climate.

1.4.2 POPULATION SIZE AND CHARACTER

The agriculturally based Bangladesh society is one of the most densely settled areas in the world, having a total population of 89,912,000 in the latest census 1981 with an area of about 143,999 square kilometres (55,598 square miles). The country has a population density of about 605 per square kilometre (1567 per square mile) (BBS, 1984: 34-37). This density is higher than all other ESCAP countries except Hongkong and Singapore (ESCAP, 1981:19). Because of high death rates population growth in Bangladesh was remarkably slow until 1961. Then, after a sharp decline in mortality, a "population explosion" resulted in a 2.6 per cent growth rate (Hong, 1980: 18-32). Since then the country has entered into the 2nd phase of demographic transition. A small decline in fertility was observed in 1975-78 (ESCAP, 1981: 111).

The existing unfavourable age structure of the population has been characterized by a large proportion of population under age 15 (Planning Commission, 1980: X111- 27). This indicates great future growth potential and a high proportion of dependent population. The population age 0-14 has constituted more than 45 per cent of the total population since the 1960s and the dependency ratio has increased from 98 in 1961 to 106 in 1974 (Hong, 1980: 9-12).

1.4.3 RELIGION

Religion is certainly a significant variable influencing fertility for most of the traditional societies influencing fertility. According to Kirk, religion and fertility are more clearly related for Muslims than for any other religions (Lucas, 1980: 84). Islam plays an important role in the every day life of the people of Bangladesh. Eighty five per cent of the total population are Muslim and 14 per cent are Hindus. Other religious groups, including Christians, Buddhists and some tribal people, amount to only one per cent (BBS, 1981: 4).

Muslims are guided by their beliefs that Allah (God) determines the number of children and provides food for them. Muslim fertility is kept at high levels by their beliefs and other norms such as (a) Islamic doctrine does not allow voluntary birth control; (b) Islam rejects sterilization and abortion; (c) Muslim culture is relatively conservative; (d) the status of women is low because of their subordinate position in the family and poor education (United Nations, 1973: 93). Hindus have less theology of an omnipotent personal deity who controls each individual's fate; their concept of fate is more involved with the concept of Karma (deed) and the complex forces of nature or the universe (Maloney et al, 1981: 41). However, Muslims' fertility is slightly higher than non-Muslims when standardized for age. The standardized mean parity for Muslims is 4.0 and for non-Muslims is 3.8 in rural areas, while in urban areas it is 3.9 and 3.6 for Muslims and non-Muslims respectively (Ahmed, 1978: 29).

1.4.4 LITERACY AND EDUCATION

The levels and trends of literacy are of crucial significance to policy makers, researchers and planners of the socio-economic and educational development of a country. However, the concept of literacy has not been defined uniformly in various censuses of Bangladesh, which makes it difficult to compare the level of literacy over time (BBS, 1984: 79). The overall literacy rate of the country was 19.7 per cent in the 1981 census, which suggests that the majority of the people are illiterate. However, as the definition used in 1981 is more stringent, it has been argued that the literacy level had actually increased compared with 17.0 per cent in 1961 and 20.2 per cent in 1974. During the period under review the female literacy level rose over the years 1961, 1974 and 1981 from 8.6 to 12.2 and 13.2 per cent respectively (BBS, 1984: 80). Contemporary survey findings on the level of literacy confirm this trend. The educational system is discussed in more detail as followed:

EDUCATION IN BANGLADESH

Education as used in this study refers to western education which was introduced during the British colonial period. However, prior to the British arrival the indigenous education system of Bangladesh evolved historically through different stages, responsive to the needs of society and dependent on local support for their maintenance. During the British period education served British colonial interests rather than local needs. Education was available only to the upper socio-economic classes. The positive side of that education system was that it provided girls with access to education. Thus, the existing formal education system is a modification of British education, namely Primary, Secondary and Higher Education.

Table 1-1: EDUCATION STRUCTURE IN BANGLADESH BY LEVELS,
CORRESPONDING GRADES, AGE OF STUDENTS AND YEARS REQUIRED

Levels of Education	Grade Obtained	Age of Students	Years Required
Primary	I - V	5 - 9	5
Junior Secondary	VI - VIII	10 - 12 +	3
Secondary	IX - X	13 - 14 +	2
Higher Secondary	XI - XII	15 - 16 +	2
Graduate (General) or Graduate (Honours)		17 - 18 + 17 - 19 +	2 3
Post-graduate (general) or Postgraduate (Honours)		19 - 20 + 20 +	2 1

Source: ESCAP, 1981: 147-150.

Table 3-1 shows the official schedule of education levels, usual age of the students and the years required for the levels. However, in actual situations, it sometimes varies, particularly the age of the students in

different grades in rural areas. Besides this, education in professions such as law, medicine, social welfare and arts is also available in professional colleges. Social welfare and fine arts are available in professional colleges affiliated to universities, the constituent colleges of the universities or in university institutes or departments. As well as formal education, technical and vocational education, religious education and non-formal education are also available, but they are not the concern of this study.

Madrasha education, the Muslim religious education, is oriented by the ideology of Islam and provides Islamic norms and instructions to the students in different stages. Although, Madrasha education plays an important role in religious education, it is also excluded from this study. Since the majority of the people are Muslims, most of them try to give at least some religious education to their children. The concern of the present study is formal/Western education, while Madrasha education is not related with the hypothesis of the present study. So, women with Madrasha education only have been included with the No Education group.

1.4.5 MARRIAGE PATTERNS

Marriage in Bangladesh is traditionally defined as the legal union between man and woman that has been solemnized through certain religious norms for the purpose of establishing a family. Hence, marriage is considered as an important social institution and is almost universal in Bangladesh. Compared with other developing countries, universality of marriage in Bangladesh is evident. For example, in the age group 20-24 in 1971, almost 95 per cent were married, compared with 91 per cent in India, 81.6 per cent in Indonesia, about 88 per cent in Nepal and 58 per cent in Thailand (ESCAP, 1981: 80). Universality of marriage is also evident from the proportion of males and females never married at ages 45-49 in different censuses, as shown in Table 1-2. It is clear, however, that the proportion never married has tended to increase slightly.

Economic, social and religious attitudes towards the importance of

Table 1-2: PROPORTION OF NEVER MARRIED MALES AND FEMALES AGED 45-49 DURING 1961-81

Sex	Prroportion Never Married		
	1961	1974	1981
Male	0.8	1.1	1.2
Female	0.2	0.5	0.7

Source: BBS, 1984: 59

marriage are primarily responsible for the practice of almost universal marriage and the low age at marriage. Early age at marriage is evident from the singulate mean age at marriage. However, the singulate mean age at marriage for females has increased to 17.8 years in 1981 from 12.6 years in 1931 while for males it has increased to 25.8 years in 1981 from 19.0 years in 1931 (BBS, 1981: 66).

Marriage in Bangladesh is mostly arranged and settled by the parents or guardians. Parents arrange the marriages of their children as a part of their moral and religious obligations and fix up the amount and nature of dowry through the middleman. Hence, marriages are arranged by the parents/guardians and sometimes dissolutions are also decided by guardians. Divorce, however, is not generally encouraged by the society. Social norms, values, social status, prestige and societal opinion are major factors in the stability of marriage.

1.4.6 FAMILY PLANNING

Family planning in Bangladesh is a very recent phenomenon, having been started in the early fifties by a group of social workers and doctors who were aware of the tremendous growth of population and its impact on the socio-economic development. In the late 1950s, with the help of the Population Council, the national family planning programme was developed and the Government discussed a population programme. This created confusion among the religious leaders, who considered it unrealistic and anti-religious. Their opinion influenced the illiterate

and religious-oriented population. As a result the Government's achievement until 1969 was only to increase knowledge about family planning to around 55 and 72 per cent in rural and urban areas respectively. However, the practice was found to be a negligible 3.5 per cent among eligible couples at that time (ESCAP, 1981: 108).

After liberation, in 1971, oral contraception and tubectomy were introduced and family planning was integrated with health services, resulting in an increase of family planning acceptors to 6.9 per cent of married and fecund women in 1975 (Planning Commission, 1975-78: X111-42). In 1976, even with the introduction of a comprehensive population policy, only 11 per cent were using an efficient method (Anon, 1984: 12). Despite huge investment in the family planning sector the acceptance rate is increasing only in a very steady and gradual way, whereas knowledge has been increased more rapidly, to above 80 per cent which indicates a great gap prevailing between knowledge and practice of family planning in Bangladesh (Hong, 1980: 74-79). Several institutional factors inhibiting the use of family planning have been identified: the side effects of the methods, unsuitability leading to disuse or withdrawal, anxiety about side effects, or the outcomes of methods, fear of social disapproval and also the unavailability and unsuitability of methods and services (Alauddin and Faruquee, 1983: 113).

1.4.7 STRUCTURE OF THE ECONOMY

The economy of Bangladesh is predominantly agricultural, with about 90 per cent of the people depending directly upon agriculture for their subsistence. Agriculture provides employment for about 80 per cent of the labour force and contributes 60 per cent of GDP/Gross Domestic Product (ESCAP, 1981: 8). The performance of agriculture, the main component of income, has been uncertain and is subject to natural disasters such as widespread periodic floods, droughts and cyclones, often accompanied by tidal waves. Those have been a major cause of severe crop damage and consequent local famine. Not only climatic disasters, but also the rapidly growing population and traditional based agriculture has led to a continuous food shortage of around 15 per cent of total food requirements.

Unemployment and underemployment in Bangladesh is substantial. Over a third of the working population is unemployed or underemployed and as the economy grew slowly there was a further deterioration of the unemployment problem during the 1970s (Planning Commission, 1981: II-2). Khan's 1972 observations that majority of the population live below subsistence level, almost half of the population are on a starvation diet, about 90 per cent have a deficiency in food of some kind, and a vast majority are almost shelterless, still hold true today. Climatic disasters, rapid population growth and the slow progress in all sectors of social life have been inhibiting the growth of economy of Bangladesh.

1.4.8 URBANIZATION

Urbanization in Bangladesh remains at low levels compared with most other countries in the region. The level of urbanization, as measured by the proportion of the total population living in urban areas, increased from 2.4 per cent in 1901 to 15.2 per cent in 1981, which is more than six fold increase over a period of eight decades (BBS, 1981:36). Although the proportion living in urban areas has been increasing, despite the large population base and pressing rural poverty, the level of urbanization in Bangladesh remains comparatively low.

The rate of growth of the urban population of Bangladesh has been exceedingly high in recent years. For example, between 1961 and 1974 the urban population grew at an average annual rate of 6.7 per cent compared with a rate of 2.3 per cent for the rural population (ESCAP, 1981: 23). This rapid growth of urban population may adversely cause problems of housing, transportation and employment in urban areas of the country.

CHAPTER 2

THE LITERATURE REVIEW ON EDUCATION AND FERTILITY

2.1 INTRODUCTION

The nature of the education-fertility relationship is one of the most frequently debated topics in recent demographic studies. Education, particularly exposure to formal schooling, is frequently studied as one of the important determinants of fertility in both developed and developing countries. Education is tending to move to the centre place in both fertility and mortality transition theory (Caldwell et al, 1985: 29). A plethora of research on differentials in fertility by education have been observed in recent years (Holsinger and Kasarda, 1976; Cochrane, 1979; Caldwell, 1980; Nag, 1979 and 1981; Jain, 1981). As Murty and Rao (1983) have pointed out these studies were based on both macro(aggregate) and micro(individual) levels and have considered education as an endogenous as well as exogenous variable. Furthermore, some other writers, while studying the relationship of fertility to some facets of social structure, have emphasised mass education as a sure means of fertility decline (Bogue, 1969; Simon, 1974; Caldwell, 1980). Research evidence has affirmed their conclusions, and it has been found that schooling exhibits a stronger and more consistent relationship to fertility than does any other social variable (Murty and Rao, 1983: 87). This study tries to elucidate both these findings in the context of Bangladesh data. This chapter will concentrate on the evaluation of the theoretical understanding of both these approaches.

2.2 THEORIES REGARDING THE EFFECT OF INDIVIDUAL LEVEL OF EDUCATION ON FERTILITY

Education has been considered in some studies to be a major factor

affecting fertility. But how does education affect fertility? According to Graff (1979), education acts in many ways, directly, indirectly and positively, as well as negatively. It can liberate or rationalize, but it can just as easily reinforce new patterns of control with implications for fertility. Holsinger and Kasarda (1976) have observed that education may influence fertility directly by changing attitudes and behavioural patterns of individuals and indirectly by affecting some other factors such as age at marriage, acceptance of family planning, and infant and childhood mortality. On the other hand, it has been argued that the effect of education on fertility is not direct. Children are not taught in school to have smaller families but the attitudes, values and behaviours learned in school interact with subsequent life experiences to produce an overall trend toward lower fertility (Graff, 1979; Lindenbum, 1984). So, education increases knowledge of western culture which may alter the traditional culture, resulting in a change in childbearing patterns; in other words, lower fertility (Caldwell and McDonald, 1982; 251). Hence it is noted that education can be an effective agent operating through the following path: more education → lower fertility values → reduced fertility (United Nations, 1983; 84). Thus from the above discussion it is clear that some studies found there is an inverse relationship between education and fertility, while others observed a positive relations between the two. Both these opinions will be discussed in the next two sections.

2.2.1 THE INVERSE RELATIONSHIP BETWEEN EDUCATION AND FERTILITY

A number of recent studies of the determinants of fertility have observed an inverse relationship, that is, falling fertility with increasing education. Cross-national studies regarding the relationship between education and fertility revealed this inverse relationship, although different methods of measuring the level of education and fertility were used (Heer, 1966; Janowitz, 1976; Freedman and Berelson, 1977; Jain, 1981; United States, 1983).

Heer (1966) used multiple regression analysis, controlling for age and income, and found a statistically significant inverse relationship between education and fertility. Janowitz (1976), also found an inverse

relationship, which was not statistically significant, while analyzing developing countries data, using regression analysis and controlling for age only. Freedman and Berelson (1977) introduced per capita income into their regression analysis and observed the relationship as the larger the proportion of illiterate population the higher the fertility. While Jain (1981b) using the same method for WFS data from 22 developing countries, found that except for Malaysia and Indonesia the remaining countries indicated a negative effect of female education on fertility. United Nations (1983) also considering education and fertility for 22 developing countries observed that except for Indonesia and Kenya the relationship was negative and was associated with development.

Not only cross-national studies but some cross-regional studies also have found an inverse relationship. Education and fertility at the sub-regional level have been correlated in some analyse for many countries. When the areas within each country are divided into urban and rural areas inverse relationships are more likely to occur in urban areas. Studies based on urban areas, Zarate (1967) found inverse correlations between education and fertility for Mexico and the same relationship was also found by Caldwell (1968) for Ghana.

A similar inverse relationship between education and fertility is also identified in a number of individual level studies (Chowdhury, 1977; Jain, 1981a). A study in India found that the available information on education, age at marriage, family size norms and use of contraception showed a negative association between education and total fertility (Jain, 1981a, 18-20). Chowdhury (1977) examined the relationship between formal education of wife and fertility in Bangladesh, as measured by number of children ever born, using regression analysis and found a statistically significant inverse relationship. He also found that this relationship holds true at every age group even when allowance is made for the effect of age at marriage, duration of marriage, women's labour force participation and husbands' income.

Thus, from the above discussion it is clear that some

cross-national, cross-regional and individual level studies identified an inverse relationship between education and fertility. However, the observed relationship between the two is not always inverse. Its nature varies from country to country and over time within a country.

2.2.2 THE POSITIVE RELATIONSHIP BETWEEN EDUCATION AND FERTILITY

Evidence suggests that education in very poor regions sometimes increases the potentiality of the biological supply of children. In the short run this increase tends to increase the actual fertility of the country (Cochrane, 1979; Cochrane, 1981; Hull and Hull, 1977; Freedman et al, 1977).

From the evidence it appears that education improves the health of women, which in turns improves their chances of conceiving or their ability to carry more births to term. Alternatively Hull and Hull (1977) argues quite oppositively that healthy women tend to receive education because they also tend to come from richer families who can afford adequate nutrition and good medical care in addition to schooling. In addition, women with higher education tend to give up the traditional behaviour of prolonged lactation and post-partum abstinence which tends to suppress fertility (Cochrane, 1981; 166). Nag (1979) has found the same pattern as Cochrane, which he explained as a close positive relationship of fertility with the decline in the practice of breastfeeding. He also mentioned that, shortened breastfeeding and postpartum periods are generally linked with urbanization and the spread of education, so in the absence of widespread use of contraceptives, a decline in breastfeeding leads to shorter birth intervals and increased fertility.

Cross-regional evidence for a positive relationship between education and fertility was found in Thailand (Cochrane, 1979). This study controled for age in measuring fertility and also used female literacy for women of the ages for which fertility was being measured. The evidence showed that in 1960 and 1970 literacy and the number of children ever born for women over 30 were positively related and this relationship was significant. For younger women the results were mixed

and not significant. In Taiwan between 1966 and 1974, the decline in education-specific total fertility rates among women aged 15-44 years, with little or no education was much greater than the corresponding fertility decline among women with higher education. This indicates that fertility was positively related to education (Freedman et al, 1977:16). But Indonesian data revealed that there was an inverted U-shaped relationship between achieved schooling and mean number of children ever born for every age group in both rural and urban areas (Hull and Hull, 1977: 46).

As Cochrane (1981: 166) concluded that education increases fertility in the environment where biological and behavioural factors are important in determining fertility. Therefore, those countries with the poorest health and nutrition combined with traditional practices of antenatal care, breastfeeding and postpartum abstinence would be most likely to experience the strong positive effect of education on fertility (Cochrane, 1981: 166). From the above discussion it is clear that in some settings at the initial stage of development the effect of education on fertility is positive, but in most settings this effect is negative.

2.2.3 DETERMINANTS OF FERTILITY AND THE INFLUENCE OF EDUCATION

The fertility behaviour of women is jointly influenced by both demand and supply factors. The demand factor depends directly on the desired family size and current family size, whereas supply factors depend on marriage and lactation practices. Fertility itself is a function of four intermediate or proximate factors: marriage, breastfeeding, use of contraception and induced abortion (Bongaarts, 1978: 108-132). In developing countries, where abortion is still negligible, breastfeeding and contraception play an important role in determining the level of fertility of married women. The present discussion concentrates on the proximate determinants excluding induced abortion. The following section reviews the literature regarding the effect of education on the proximate determinants of fertility and how they in turn affect the overall fertility.

Marriage

Among the proximate determinants of fertility marriage plays an important role in determining the level of fertility in a population and explaining the fertility differentials among different subgroups or regions within a population or a national boundary. As United Nations (1969), pointed out, intermediate variables such as age at marriage and the proportion married are both closely related to education and account for much of the variation in fertility.

Evidence suggests that age at marriage is positively related to fertility, while early marriage of women has been considered as an important factor in high fertility. It is argued that increases in age at marriage, particularly for women, has been found to be an important contributing factor in the reduction of fertility in developed as well as less developed countries (Nag, 1974: 294-298). In general, in most countries the average age of women at first marriage tends to increase with education, employment and urbanization (Dixon, 1971: 217). According to Cochrane (1981), female education seems to reduce the years married by raising the age of marriage and, in some countries, reducing the proportion of married. Jain (1981a), also found that in India increased education seems to lead to an increase in age at marriage.

Thus, large increases in the educational level of women not only increase age at marriage, but also decrease the proportion married at younger ages on the basis of the historic negative relation between education and the proportion married in the younger childbearing ages (Freedman et al, 1977: 11-18). However, this study also found that at ages over 30, such differential effects were negligible since a substantial majority of this age group were married. So, the effect of education in the younger child bearing ages is more prominent than the older ages.

Breastfeeding

The primary purpose of breastfeeding in all societies is to provide food to infants but in some societies breastfeeding is practiced because of a belief in its effectiveness for postponing conception. Breastfeeding has inhibitory effects on ovulation and thus increases birth intervals and reduces natural fertility (Bongaarts, 1978: 115).

The duration of breastfeeding varies according to mother's age, parity, education, place of residence and husband's occupation. Studies show that mother's age has been found to have a positive influence on the duration of breastfeeding (Jain et al, 1970: 225-227). According to Caldwell and Caldwell (1977), breastfeeding behaviour varies with parity, whereas for Taiwanese women Jain et al (1970), observed in a multiple regression analysis that women's parity did not have any significant effect on breastfeeding after controlling for education and place of residence. However, a number of surveys in less developed countries have indicated a negative relationship between education and breastfeeding. The evidence from developing countries suggests that mothers with no education have a longer duration of breastfeeding, whereas mothers with secondary and higher education have a shorter duration. The difference between those with no education and those with primary education is generally less than that between those with primary education and those with secondary or higher education. Thus the negative effect of education on breastfeeding is stronger above primary level (Jain and Bongaarts, 1981: 77-99). Although the experiences of different countries are not strictly comparable, WFS data for Thailand, Korea and Malaysia show a similar association between duration of breastfeeding and levels of education (Knodel and Debavalya, 1980: 355). Similar findings resulted from surveys conducted in Taiwan (Jain et al, 1970: 225-259) and Nigeria (Lucas, 1977: 409-422).

Therefore, the effect of education on breastfeeding seems to be negative and the consequences of this for fertility are positive. Nag (1979) shows that the decline of breastfeeding increases fertility,

operating through the mechanism of fecundity, postpartum abstinence and infant mortality. Educated women shorten and sometimes abandon the practice of breastfeeding in less developed countries, without using any birth control measures, so the fertility level of these countries is likely to increase. Also, a decline in breastfeeding may lead to a decline in postpartum abstinence, hence increasing fertility. Moreover, declining breastfeeding increases bottlefeeding. In the absence of proper sanitary conditions and adequate substitute infant foods, this can lead to higher infant mortality which is commonly considered as an important factor responsible for higher fertility (Nag, 1979: 10).

From the above discussion it is clear that survey data from less developed countries show that, in general, educated mothers breastfeed for a shorter period than uneducated mothers. However, the data do not as consistently identify the critical level of education at which duration of breastfeeding begins to decline. On the other hand, the mechanisms by which education affects the duration of breastfeeding are undetermined, so the specific mechanisms and how they operate require further study (Nag, 1983: 165).

Contraceptive Knowledge and Practice

Contraceptive practice is the intermediate variable primarily responsible for variations in the levels of fertility within marriage. In most traditional developing countries the practice of contraception may be rare or sometimes virtually absent and marital fertility is relatively high. It is assumed that the effect of education on the birth interval is transmitted through the use of contraception, which comes through the path of education to contraception and contraception to birth interval (Jain, 1981b: 579). Evidence suggests that the effect of education on birth intervals through the use of contraception is positive and its effects on fertility are negative. A number of studies have found a positive relationship between education and use of contraception (Chowdhury, 1977; Freedman et al, 1977; Jain, 1981b; United Nations, 1983).

It has been observed that education improves attitudes towards and knowledge of contraception which results in increases in the use of contraception (Cochrane, 1981: 163). However, the variation in using contraception comes from different levels of education. For example, the percentage of women using contraception increases from women with no education to women with higher education (Jain, 1981a: 18). Thus, the positive relationship between education and contraception holds true when an allowance is made for the effect of age, parity, wife's labour force participation status and husband's income (Chowdhury, 1977: 92).

This positive relationship between education and contraceptive knowledge and practice is not obvious. Evidence from 22 less developing countries revealed that the differences in contraceptive use between those with no education and those with small amounts of education (one to three years of schooling) were minimal. However, a significant use of contraception among uneducated women is directly related to development (United Nations, 1983: 85).

2.3 THEORIES REGARDING THE EFFECT OF MASS EDUCATION ON FERTILITY

From the above discussion it appears that the existing literature does not analyse the onset of fertility transition and the onset of universal education. Also the literature has tended to concentrate more on the impact of education on the parental generation rather than on the children (Caldwell, 1980: 229). However, there are a plethora of studies on individual education and its effect on fertility, but on the other hand, a smaller number of studies of mass education and fertility.

In 1969, Bogue argued that education is a sensitive component of both intra-generational and inter-generational mobility. The driving forces that lie behind the demographic transition are rising literacy and educational attainment and both those are closely related to lower fertility. It is necessary to 'mass-produce' it on a large scale to hasten fertility decline. Bogue (1969) also mentioned that rising education, increases in school attendance and resulting increase in age

at marriage tend to be more powerful weapons in promoting fertility decline than urbanization and industrialization.

Simon (1974) stated that the relationship between education and fertility is more consistent and even stronger than the relationship between fertility to any other single variable, but the nature of the casual connection between education and fertility is more complex. According to Simon, the effect of education in promoting parents' fertility decline is through their children, because with the increase of educational facilities parents may choose to invest more for children's education rather than to use children's labour. He also pointed out that an increase in income is associated with a rise in education, communication and mobility and alters the structure of people's tastes for children versus other expenditure (Simon, 1974: 1620). However, unlike Caldwell (1980), Simon does not emphasize the effect of mass education on fertility.

Caldwell (1980) argued that the primary determinants of the timing of the onset of fertility transition is the effect of mass education on the family economy, and with the introduction of mass education the direction of the flow of wealth between generations is changing. He also mentioned that the important force in demographic change is formal schooling rather than widespread attainment of literacy without mass schooling. The impact of education on fertility is not direct but rather through restructuring the family economy and the direction of the flow of wealth of the family. Caldwell's theory focuses on demographic transition. He classified world population into two major groups of societies. The developed societies, which have experienced the demographic transition, now have a family morality where children receive resources from their parents, which is a part of capitalistic production. Economic values decrease the desirability of having more children, which implies lower and controlled fertility. In the other type of society, characterized by a traditional family economy, children provide more resources than they receive, so net economic gains from children to parents implies stable high fertility. However, schooling tends to restructure this traditional family economic morality by

changing the recipients of the flow of wealth from parents to children and leading to the onset of fertility decline. Caldwell also stated that some developing countries or states achieved universal education before increasing the level economic development. This resulted in fertility decline in these society, the most notable examples being Kerala and Sri Lanka.

2.3.1 KERALA

Kerala currently has the lowest fertility level of all the Indian states. In 1978, the Crude Birth Rate for Kerala was 25 per 1000 compared to 40 in Uttar Pradesh, 33 in Orissa, 36 in Gujrat and 34 in Haryana (Muthiah and Jones, 1983: 282). However, Kerala was not always the state with the lowest fertility. At least up to 1951-61, the birth rate in Kerala was as high as 46, higher than that of states such as Uttar Pradesh and Orissa with 43. Kerala's dramatic fertility decline started within the last two decades without significant improvements in income and urbanization. This is a different experience from developed and some developing countries, where fertility declines have been preceded by improvements in income and increased urbanization and industrialization. Yet, in India, there are some states which have higher per capita income and are more urbanized and industrialized than Kerala but have higher fertility (Nag, 1982: 8).

The available data indicates that two factors were responsible for the decline in fertility in Kerala; higher age at marriage for women in 1960s and increases in the practice of family planning methods by married couples in the 1970s. Compared with other variables, education appears to contribute significantly towards these change. Nag (1982) stated that Kerala achieved the highest literacy rate, far out-distancing all other states. For example, 60 per cent of the population of Kerala were literate in 1971 compared with 33 per cent in West Bengal and 30 per cent in all India. Female literacy in Kerala was also more marked in 1971 when 53 per cent of rural females of Kerala were literate compared with 13 per cent in rural India.

Apart from the success in achieving high literacy rates, mass

education contributed more to a dramatic decline of fertility in Kerala. During the first five centuries of the Christian era, great emphasis was placed on providing education, using temples as centres. Indigenous schools had grown up by the end of the 19th century, so every village in Kerala had a school at that time. During British rule in India, the existing circumstances in Kerala favoured promoting primary education and at that time even local rulers were interested in providing education and health facilities. This increased lower level education. In 1978, 86 per cent of children under 6-10 years and 77 per cent in 11-13 years were enrolled in school compared with 66 and 50 per cent of these age groups in all India (Nag, 1981: 35-37). Moreover, children do less work in Kerala than in other states. This background situation accords with Caldwell's theory of mass education and its influence in demographic change and decline in fertility in Kerala.

2.3.2 SRI LANKA

An island country, Sri Lanka is treated as an example of a pronounced reduction in fertility which was achieved by education at the mass level in recent decades. A significantly higher proportion of girls in Sri Lanka completed junior secondary levels of education which is likely to effect a considerable reduction in fertility (Fernando, 1977: 339). The effect of educational attainment of women is characterized by (1) the impact of higher educational attainment on postponement of marriage (2) the contribution towards higher levels of spinsterhood and (3) the reduction of total fertility of ever married women using effective contraceptive methods (Fernando, 1977: 350).

A changes in the proportion of women marrying was the most notable factor in the decline in the crude birth rate during 1963-71. The changes in marriage pattern of women of different ages are reflected in Table 2-1:

The change in the marriage pattern among the younger ages of women is most noticable over the last few years. It appears that the proportion of women marrying was a significant factor contributing to

Table 2-1: CHANGES IN THE PATTERN OF MARRIAGE IN SRI LANKA
1946-1971

Age of Women	Percentage Married		
	1946	1963	1971
15 - 19	24	15	10
20 - 24	68	58	46
25 - 29	84	81	74

Source: Immerwahr, 1977: 193.

the decline of fertility during the period 1963-71, and accounted for all of the reduction in the crude birth rate during this intercensal period (Fernando, 1976: 37). An increase in fertility decline is associated with the attainment of successive levels of education of women in the reproductive ages.

The level of spinsterhood increases with educational level. In the 1971 census, in the age group 30-34 over 25 per cent of those with O level of education and 21 per cent with A level and higher education were still single, while in the age group 40-44, there were over 6 and 10 per cent spinsters at the highest and next highest levels of education was observed in the 1971 census (Fernando, 1977: 341).

The influence of education on female labour force participation was also evident in the 1971 census. The combined proportion of females below 30 years of age in schools and in the labour force increased in all except the age group 10-14 during 1963-71. Both the economic aspects of educational status (opportunity cost of the labour market) and the social aspect of educational status have important effects on female labour force participation rates (Wilson, 1975:61-62). So the decline in the birth rate and the change of social attitudes towards women's responsibility in society is enhanced by increasing female education, which tends to increase female labour force participation rates in Sri Lanka .

There has been a continuous increase in literacy since 1881. The literacy rate for the population aged 10 years and over increased from 17 per cent in 1881 to 78 per cent in 1971. The progress made in female literacy has been remarkable. The percentage of female literacy increasing from 3 per cent in 1881 to 71 per cent in 1971 (ESCAP, 1976: 226). The high literacy rate achieved in Sri Lanka was facilitated by the introduction of free education in the second half of the 1940s, and the subsequent expansion of educational facilities throughout the country.

Besides improving the literacy level, the free education system also has significantly helped to improve the educational attainment of the population. In the 1971 census it is evident that the younger age groups have greater proportions with higher educational levels. For example, in the age group 25-29 only 18 per cent had no schooling compared to 32 per cent for age group 45-49. This mass level of education attainment and higher literacy rates together facilitate the change in social attitudes and biological behaviour towards large families resulting in the decline in fertility in Sri Lanka.

Other literature is concerned with such thing as regarding the effect of education on desired family size, infant and child mortality and female labour force participation. Since the present study is concerned with the proximate determinants this literature has not been reviewed here.

CHAPTER 3

THE EFFECT OF INDIVIDUAL LEVEL OF EDUCATION ON FERTILITY

3.1 INTRODUCTION

The biological and behavioural dimensions of human fertility are linked through a set of 'intermediate fertility variables' or 'proximate determinants' of fertility (Bongaarts and Potter, 1983: ix). The mechanism through which socio-economic variables influence fertility is the important issue in the demographic analysis of fertility differentials, so demographers have turned to studies of the intermediate or proximate variables determining fertility.

The term intermediate fertility variable was first introduced by Davis and Blake in the mid 1950s. Davis and Blake (1956) defined intermediate variables as a set of biological and behavioural factors that directly affect the fertility level in every society. Although the Davis and Blake framework found wide acceptance, difficulties arise with the quantitative interpretation of this model. Since the pioneering work of Henry in the early 1950s, a variety of models that incorporate the determinants of fertility have been constructed (Bongaarts, 1982:179). Following this pioneering work, during the 1960s, a number of researchers such as Potter, Sheps and Tietze persuaded the investigation of the proximate determinants (Bongaarts and Potter, 1983: 2). Much of their work was more realistic but their models for the relationship between fertility and the intermediate fertility variables are sometimes complex.

3.2 THE BONGAARTS MODEL

In the late 1970s, Bongaarts proposed a set of intermediate fertility variables that is different from but closely related to, the Davis and Blake set. He called them proximate determinants of fertility (Bongaarts, 1982: 179). According to Bongaarts, the proximate determinants of fertility are the biological and behavioural factors through which social, economic and environmental variables affect fertility. He also mentioned that the principal characteristic of a proximate determinant is that it influences fertility directly while socio-economic variables affect fertility indirectly through modifying the proximate determinants.

One of the most important advantages of including proximate determinants in the study of fertility is that they improve understanding of the operation of the socio-economic determinants on fertility (Bongaarts et al, 1984: 516). A socio-economic variable can have negative effect on fertility through proximate variables. For example, education can increase use of contraception. On the other hand, education can have a positive effect, such as by reducing the duration of breastfeeding. Thus, the overall effect of socio-economic variables can be positive or negative, significant or insignificant, depending on the relative contribution of the effect of the proximate determinants (Bongaarts, 1984: 516).

A complete set of seven proximate determinants of fertility is listed below, (Bongaarts, 1982:179) of which the first four variables are considered by Bongaarts in his model.

- (1) Proportion of females married
- (2) Contraceptive use and use-effectiveness
- (3) Prevalence of induced abortion
- (4) Duration of postpartum non-susceptibility

(5) Fecundibility (or frequency of intercourse)

(6) Spontaneous intrauterine mortality

(7) Prevalence of permanent sterility

Each of these seven variables directly influences and causes changes in fertility. Together they determine the level of fertility of any population or subgroup of population. At the individual level, there are wide variations in the total number of births per women during their reproductive years because women typically differ in the context of all these seven factors. On the other hand, at the aggregate level, it is observed that in most populations only the first four variables are important in the analysis of fertility differentials and changes because variations in the population averages of the other factors are not large enough to make a substantial contribution to fertility differences (Bongaarts, 1978: 105-131).

Therefore, proportion married, contraception, induced abortion and postpartum non-susceptibility are the four basic variables in Bongaarts' model of proximate determinants of fertility. These four variables have been measured in the model as four indices; C_m , C_c , C_a and C_i respectively. The index can take values between 0 and 1. When there is no fertility-inhibiting effect of the proximate determinants the index value equals 1 and if there is some inhibiting effect the index equals less than 1 but if the inhibition is complete, the index equals 0 (Bongaarts and Potter, 1983: 80). Furthermore, the model is multiplicative and expresses the actual level of fertility, that is the Total Fertility Rate or TFR as:

$$TFR = C_m \times C_i \times C_c \times C_a \times TF \quad - - - - - (1)$$

However, it is noted that the model is not intended as a tool for estimating fertility. Although it is used for that purpose, the model's objective is to quantify the effect of different proximate determinants.

Bongaarts' model of the proximate determinants of fertility is a very simple model. Its construction and validation has been made possible by the increased number of empirical measures of the proximate variables in many populations.

The Bongaarts model will be used in this study to determine the proximate determinants responsible for fertility differences among educational subgroups and education areas in Bangladesh. The objective of this chapter is to demonstrate that differences in fertility among educational subgroups of the population are largely due to variations in the four proximate determinants of fertility. This chapter will also concentrate on the role of education in effecting differences in the proximate determinants as well as overall fertility among the subgroups of population in Bangladesh.

The study population has been subdivided according to formal educational level. This classification is based on respondents' years of schooling. The completed years of schooling are grouped into four categories: No Schooling, 1-3 years, 4-6 years and 7+ years of schooling, these represent No Education, Incomplete Primary, Completed Primary and Secondary and Higher Education categories respectively. A detailed discussion about the educational system in Bangladesh has already been produced in Chapter 3, section 1.4.4. The World Fertility survey (WFS) classification of education has been adopted for the present study to make it comparable with previous relevant studies (Alam and Casterline, 1984: 10). The next section will concentrate on estimating and analysing the indices of the proximate determinants of fertility among four educational groups in Bangladesh.

3.3 THE INDEX OF MARRIAGE = Cm

The index of marriage aims to determine the age-specific proportion of all women who are currently married. Cm is not simply the proportion of all women of reproductive age who are married, because marriage in the central childbearing ages contributes more to the Total Fertility Rate (TFR) than at younger or older ages, as age-specific marital

fertility rates reach their maximum in the central childbearing ages (Bongaarts and Potter, 1983: 81-83). According to Bongaarts and Potter (1983), to take account of this age effect, the index C_m is estimated as the weighted average of the age-specific proportion of females currently married, with the weights provided by the age-specific marital fertility rates. C_m can be estimated with the following equation:

$$C_m = \sum m(a) \times g(a) / \sum g(a) \quad - - - - - (2)$$

Where, $m(a)$ = age specific proportions of currently married women among females, and $g(a)$ = age specific marital fertility rates.

The $m(a)$ value has been obtained for educational subgroups from the 1975 WFS household survey data and the $g(a)$ value has obtained from the Bangladesh Fertility Survey Data, 1975-76. However, the numerator of the equation equals the Total Fertility Rate (TFR) and the denominator equals Total Marital Fertility (TM). Using Equation No 2, the obtained C_m values for the four education groups are shown in Table 3-1.

Table 3-1 throws light on the relationship between female marriage patterns and formal education. The index value suggests that for the shorter duration of schooling there is a positive relation between education and the weighted average of the age-specific proportion of females currently married but for the longer duration this relationship is negative. For example, the index of marriage increases to 0.90 in women with Completed Primary Education compared with 0.85 for women with No Education. However, the inverse relationship is enhanced with 7+ years of schooling (Secondary and Higher Education) and there is a sharp decline in the index values to 0.81 among this education group compared with the 1-3 years and 4-6 years education groups. A relatively late age at marriage and high rate of marital disruption may be the cause of their lower index of marriage. Concepcion (1980) has found the same for 18 developing countries. Late marriage is also found among Secondary and Higher Education groups in Pakistan, Mexico, Indonesia, Colombia and Korea (Bongaarts and Potter, 1983: 61). However, a higher index value is

Table 3-1: THE Cm VALUES AND THE CORRESPONDING OBSERVED TOTAL FERTILITY RATE (TFR) AND TOTAL MARITAL FERTILITY RATE (TM) BY EDUCATION SUBGROUPS

Years of schooling	Educational level	Observed		Index of Cm
		TFR	TM	
0	No Education	6.25	7.38	0.85
1 - 3	Incomplete Primary	6.49	7.32	0.89
4 - 6	Completed Primary	7.05	7.86	0.90
7 +	Secondary and High	5.49	6.81	0.81
	Bangladesh	6.35	7.40	0.86

Source : BFS Data Tape, 1976.

found among those with No Education, Incomplete Primary and Completed Primary Education, where marriage is both early and universal.

3.4 THE INDEX OF POSTPARTUM NON-SUSCEPTIBILITY = Ci

This intermediate variable is made up of the effect of prolonged breastfeeding (lactation-related anovulation and amenorrhoea) and the length of the postpartum taboo on sexual relations, which is termed postpartum non-susceptible period (Lesthaeghe et al, 1981: 7), will be abbreviated here to NSP. Variations in NSP make major differences in the TFR among population of a non-contracepting society. The effects of amenorrhoea and abstinence are not the same at the individual and population level. For individual women, the duration of the NSP equals the duration of abstinence or the duration of amenorrhoea, whichever is longer. At the population level, there is substantial variation around the mean duration of abstinence and amenorrhoea, so that the average duration of the NSP will be longer than the average durations of either abstinence or amenorrhoea (Bongaarts et al, 1984: 523-524).

While data on anovulation would be best for measuring the length of NSP, it is difficult to collect through population surveys. So, data on amenorrhoea are usually used as a proxy for the NSP, because the period of amenorrhoea is closely related to the anovulatory period. Although the two periods do not last exactly the same number of months, both periods are dependent on duration of frequent and intensive breastfeeding (Gaisie, 1984: 20-22).

In most societies the duration of postpartum infecundity equals the duration of amenorrhoea because little or no postpartum abstinence is practiced. On the other hand, in a few societies, postpartum abstinence is practiced widely and for prolonged periods, resulting in abstinence intervals that exceed most periods of amenorrhoea (Bongaarts and Potter, 1983:24). For example, postpartum abstinence has been observed as a determinant of the duration of NSP in Ghana and Western African societies (Gaise, 1984; Caldwell and Caldwell, 1977; Page and Lesthaeghe, 1981; Santow and Bracher, 1981). Therefore, postpartum abstinence is treated in the same way as postpartum amenorrhoea since both these variables start at delivery. This study considers the overall NSP or non exposed period following a birth, whichever is longer.

Thus the period of NSP is measured in the model by the index of C_i , which equals the ratio of the average birth interval with and without postpartum infecundibility. It is thus the ratio of natural fertility in the presence and absence of observed NSP. This index assumes that in the absence of breastfeeding and postpartum abstinence, the birth interval averages about 20 months, which is the sum of 1.5 months of anovulation, 7.5 months of waiting time for conception, 2 months of time added by spontaneous intrauterine mortality, plus a full-term pregnancy of 9 months. In the presence of breastfeeding and postpartum abstinence, the average birth interval equals about 18.5 months (7.5+ 2+ 9) plus i , the duration of postpartum infecundibility (Bongaarts and Potter, 1983: 85). Therefore, the index C_i is estimated using the following equation:

$$C_i = 20 / 18.5 + i \quad - - - - - \quad (3)$$

Where, i equals average duration of NSP caused by postpartum abstinence. To estimate i the Prevalence Incidence Technique has been used.

3.4.1 THE PREVALENCE INCIDENCE TECHNIQUE

The Prevalence Incidence Technique is use for estimating the mean duration of postpartum variables. The estimation procedure is based on the relation between the prevalence, incidence and average duration of a postpartum condition. The numerator of the technique does not require any information on dates while the denominator requires the dates of birth of children (Page et al, 1982: 31). However, the prevalence incidence mean refers not to the mothers but to the children. This technique is based on the assumption on a constant flow of births in the recent past and it also assumes stability in postpartum abstinence and amenorrhoea. Since this technique is particularly useful for analysing subgroups whose sample sizes are small, it would be useful in this study to analyze the subgroups based on different educational levels.

To estimate i , the mean duration of NSP, the equation used here as follows:

$$i = P / I \quad \text{--- -- -- -- --} \quad (4)$$

where P is the prevalence, which includes the number of women still in amenorrhoea or abstinence at the time of interview according to their age and education, while I is the incidence or average monthly number of births over the last two, three or four years by age and education of mother. Different reference periods are used to check the stability of estimates since incidence will be affected by misreporting of dates of birth. Thus the value of i in a two, three and four year period, using Equation 4 and the corresponding index value of C_i estimated by Equation 3 have been presented in Table 3-2.

Table 3-2: THE MEAN DURATION OF POSTPARTUM NSP(i) IN MONTHS
AND CORRESPONDING Ci VALUES BY EDUCATION SUBGROUPS

Educational level of	Mean duration of NSP (i)		
	24 Months *	36 Months *	48 Months *
No Education	18.83	18.21	18.06
Incomplete Primary	16.60	17.06	17.67
Completed Primary	11.78	12.39	12.50
Secondary and Higher	10.01	11.28	11.83
Bangladesh	17.24	17.09	17.11

Mothers level of education	Index of Ci		
	24 Months *	36 Months *	48 Months *
No Education	0.54	0.54	0.55
Incomplete Primary	0.57	0.56	0.55
Completed Primary	0.66	0.65	0.65
Secondary and Higher	0.70	0.67	0.66
Bangladesh	0.56	0.56	0.56

* Reference period to estimate incidence.

Source: BFS Data Tape, 1976.

The patterns of NSP among the four educational subgroups over three durations of time is reflected in the top panel of the Table 3-2. It will be seen that women with No Education have the highest mean duration, irrespective of the length of the reference period, followed by the Incomplete Primary Education group. Secondary and Higher Educated women exhibit the lowest durations. Thus the mean duration of NSP (i) ranges from about 12 months after births to women with more formal education to about 18 months after births to women with No Education.

So, for the No Education group the mean duration of NSP lasts on average about 6 months longer than for the Secondary and Higher Education groups. In Ghana, Gaisie (1984) also found that the NSP following births to non-educated women was longer than the women with primary and middle schooling and than also for those with secondary and more formal education, by four and seven months respectively.

However, the differences between women with Incomplete Primary and No Education in the study population are small. Differences only start to become significant with Completed Primary Education, followed by Secondary and Higher Education. The results of C_i for three durations prior to the survey are shown in the lower panel. A rising trends in index value is observed with the movement of women from the lowest level of education. Higher index values however, indicate a lower duration of i.

3.5 THE INDEX OF CONTRACEPTION = C_c

Contraceptive practice is one of the proximate determinants of fertility primarily responsible for variations in the level of fertility within marriage in populations. In developing countries, however, the practice of contraception is rare or virtually absent, therefore marital fertility is relatively high, while in developed countries marital fertility is lowest, because over half of the married women in the childbearing ages are current users of contraception (Bongaarts, 1978: 8). In Bangladesh only 9.6 per cent of women were users of contraception at the time of the survey (WFS, 1978: 77).

Although the use of contraception still plays a very limited role in determining fertility in Bangladesh, variations in contraception use wrere obtained by the index of contraception, C_c . Variations in the index of contraception depend on the prevalence and use effectiveness of contraception practiced by couples in the reproductive age groups and their levels of education. C_c can be estimated with the following Equation:

$$C_c = 1 - 1.08 \times u \times e \quad - - - - - (5)$$

Where, u = average proportion married of women currently using contraception and, e = average use-effectiveness of contraception.

In this equation the coefficient 1.08 represents an adjustment for the situation where women do not use contraception while they know that they are sterile. Contraceptive practice becomes concentrated among non-sterile couples when the sterile couples do not practice any contraception. To take this into account, the variable u , which measures prevalence of contraception among all couples, has to be inflated by this sterility correction factor (Bongaarts and Potter, 1983: 84).

The variable u for calculating the index of C_c has been estimated from BFS but as in most other developing country data, the variable e can not be calculated from the Bangladesh Fertility Survey data, because information on method specific use-effectiveness $e(m)$, is not available. Since the $e(m)$ value is unavailable for Bangladesh, the Philippine adjusted values have been used in this study, as used by Bongaarts and Potter (1983: 70). The proportion of women using given methods and method specific use-effectiveness by levels of education of women are shown in Table 3-3.

Table 3-3 indicates differentials in the use of contraceptive methods and method specific use effectiveness by education of women. About 22 per cent more women with Secondary and Higher Education used contraception than women with No Education. A fluctuation in use of IUDs among the different education levels of women is observed. However, the proportion using other forms of contraception increases quite markedly with increases in the level of education of women.

Table 3-3: PROPORTION OF ALL WOMEN WHO ARE USING
CONTRACEPTIVE METHOD, u(m), AND THE METHOD SPECIFIC
USE-EFFECTIVENESS, e(m), BY EDUCATION SUBGROUPS

Name of method	u(m)					*
	No Education	Incomplete Primary	Completed Primary	Secondary and Higher	Bangla- desh	
Pills	0.022	0.036	0.048	0.129	0.034	0.90
IUD	0.004	0.003	0.002	0.004	0.003	0.95
Sterili- zation	0.007	0.009	0.019	0.029	0.010	1.00
Others	0.024	0.050	0.056	0.112	0.036	0.70
u	0.057	0.098	0.125	0.274	0.083	

Source: BFS Data Tape, 1976.

* Bongaarts and Potter, 1983: 84.

Using the values of u(m) from Table 3-3, the average use effectiveness, e, can be obtained by Equation 6.

$$e = \sum e(m) \times u(m) / \sum u(m) \quad - - - - - \quad (6)$$

Where, e is the average use-effectiveness which is estimated as the weighted average of the method specific use-effectiveness levels e(m), with the weight equals to the proportion of women using a given method (Bongaarts and Potter, 1983: 84). Thus, the results of e and the index value are shown in Table 3-4.

Table 3-4 indicates a very high index value of about 0.95 among the No Education group, which exhibits a very low contraceptive prevalence. The Cc value gradually declines with the increase in years of schooling. From the above findings it is clear that there is a positive relationship between education and contraceptive use with contraceptive prevalence tending to be higher among educated women than among women

Table 3-4: THE AVERAGE USE-EFFECTIVENESS (e) AND THE
CORRESPONDING INDEX VALUES , Cc, BY EDUCATION SUBGROUPS

Levels of Scholing	e	Cc
No Education	0.832	0.946
Incomplete Primary	0.806	0.913
Completed Primary	0.824	0.885
Secondary and Higher	0.826	0.758
Bangladesh	0.831	0.928

Source :BFS Data Tape, 1976.

with no education. Generally, the higher the number of years of schooling, the higher the prevalence of contraceptive use, although the difference in use of contraception between No Education and Incomplete Primary Education is not insignificant. Similar conclusions were drawn for Pakistan, Lesotho and Bangladesh in a study of 28 countries (Sathar and Chidambaram, 1984: 17), and Mexico, Indonesia, Colombia, Korea, France(1972), and U.S (1970) in a study of 7 countries (Bongaarts and Potter, 1983: 65).

3.6 THE INDEX OF ABORTION = Ca

Estimates of the induced abortion rate produced by Bongaarts and Potter are based on the number of reported legal abortions. Thus, the total abortion rate is defined as the average number of induced abortions per women at the end of the reproductive years if current age-specific abortion rates prevail throughout the childbearing years (Bongaarts and Potter, 1983: 71). Induced abortion contributes a minor or negligible role to the total fertility rate in most developing countries. Many developing countries have restrictive laws about induced abortion and as a result levels of induced abortion are likely to be low or negligible. In Bangladesh, as in many other developing countries,

induced abortion is thought to be virtually non-existent (Chen et al, 1974:279). Reliable statistics for induced abortion are not available in Bangladesh and questions about the incidence of induced abortion were not included in the WFS (Jain and Bongaarts, 1980: 256). Therefore, the index value C_a is assumed to equal 1.0.

3.7 TOTAL FECUNDITY = TF

TF is the Total Fecundity determined by three secondary proximate determinants of fertility: waiting time to conception, the risk of intrauterine mortality and the onset of permanent sterility. In the Bongaarts model these secondary determinants are not separately represented by indexes. Their combined effect is measured by the TF, and evidence suggests that variations in these secondary factors have relatively little influence on fertility. As a result TF varies modestly among populations or subgroups of the same population except in unusual cases such as a high incidence of disease-induced sterility or prolonged spousal separation (Bongaarts, 1981:114). According to Bongaarts (1978), the large majority of the population can be expected to have TFs between 13 and 17 births per women, with an average of 15. In this study a TF value is obtained by the following Equation:

$$TF = TFR / C_m \times C_i \times C_c \quad - - - - - (7)$$

$$6.35 / 0.85 \times 0.56 \times 0.93 = 6.35 / .448 = 14.17$$

Using this equation the TF value for Bangladesh is measured as 14.17, which will be used for the education subgroups as well as education areas.

3.8 DECOMPOSITION OF CHANGES IN FERTILITY

From the above analysis summary estimates of the indices of the four proximate determinants of fertility and the model estimates of TFR based on Equation 1, are shown in Table 3-5.

Table 3-5: ESTIMATES OF THE INDEXES OF THE PROXIMATE DETERMINANTS OF FERTILITY AND MODEL ESTIMATES OF THE TOTAL FERTILITY RATE BY EDUCATION SUBGROUPS

Education levels	Index of Marriage (Cm)	Index of NSP (Ci)	Index of Contra- ception (Cc)	Index of Abortion (Ca)	Index of Total Fecun- -dity (TF)	Total Fertility Model	Total Fertility Observed
No Education	0.85	0.55	0.95	1.00	14.17	6.29	6.25
Incomplete Primary	0.89	0.55	0.91	1.00	14.17	6.31	6.49
Completed Primary	0.90	0.65	0.89	1.00	14.17	7.38	7.05
Secondary and Higher	0.81	0.66	0.76	1.00	14.17	5.76	5.49
Bangladesh	0.86	0.56	0.93	1.00	14.17	6.35	6.35

Source: Based on Tables 3-1, 3-2 and 3-4.

This Table indicates the contribution of each determinant to the overall fertility of different education groups. Women with No Education have a very protracted duration of NSP which is offset by virtually negligible use of contraception (Cc equals 0.95) and, once again, a relatively high proportion of married women, although their achieved fertility is lower than for the later two groups.

A higher proportion of women with Incomplete Primary Education are married, and all other fertility inhibiting factors are almost the same as the No Education group. Their fertility is therefore, very close to, although slightly higher than the No Education group.

On the other hand, women who had Completed Primary Education achieved the highest total fertility rate among the four education groups, with a comparatively shorter duration of NSP, higher proportion married and little use of contraception.

Another pattern is the very short duration of NSP among the group with Secondary and Higher Education which shows significant use of contraception and a relatively low proportion married. Therefore, its total fertility remained below that of the high fertility group.

However, a comparison of the model estimates of TFR with the observed TFR (see Table 3-5) reveals that they are fairly close for the No Education and the Incomplete Primary Education groups, while model TFR is some higher than observed TFR for the Completed Primary Education and Secondary and Higher Education group. The difference is probably due to some errors in the estimation of the C_i or C_c , and the possibility that C_a is less than 1.0. This is perhaps also because of the assumption that TF is constant for the subgroups of the population. The variation in fertility that is not explained by the intermediate variables used in the analysis may be due to the following factors suggested by Bongaarts (1982):

- (1) errors in the measurement of the proximate determinants
- (2) errors in the specification of the model
- (3) errors in the observed total fertility rates
- (4) the assumption of legitimation of all births is violated in some developing countries.

An attempt is made here to quantify the extent to which each variable contributes to the determination of the actual level of fertility (see for example Table 3-6). The average total fecundity rate, TF, for each subgroup is assumed to 14.17. From Table 3-6 it is evident that the duration of the NSP exercises a very strong impact, reducing the total fecundity rate by 45 per cent among those with No Education and the Incomplete Primary Education group. This impact reduces to 35 per cent for women with Completed Primary Education followed by 32 per cent for the Secondary and Higher Education group. Although there is no difference between the No Education and Incomplete Primary Education

Table 3-6: ESTIMATES OF DIFFERENT FERTILITY LEVELS FOR
BANGLADESH AND EDUCATIONAL SUBGROUPS

Fertility Levels	Bangla- desh	No Education	Incomplete Primary	Completed Primary	Secondary and Higher
Total Fecundity Rate, TF	14.17	14.17	14.17	14.17	14.17
Total Natural Fertility Rate TN = $C_i \times TF$	7.94	7.79	7.79	9.21	9.35
Total Marital Fertility Rate TM = $C_c \times C_a \times TN$	7.38	7.40	7.09	8.20	7.11
Total Fertility Rate TFR = $C_m \times TM$	6.35	6.29	6.38	7.38	5.76

Source: Based on Table 3-6.

group, there is a substantial difference between those two groups and the Completed Primary Education group and Secondary and High Education group.

From Table 3-6, it is also clear that estimated total natural fertility rates reduce with increasing levels of education of married women, due to a significant use of contraception. It is noted that the influence of this variable is more marked among women with Secondary and Higher Education compared with women with No Education. It is worth noting that women with No Education experienced virtually no use of effective contraception, hence a small reduction in the natural marital fertility rate of 7.79 to a total marital fertility rate of 7.40 is observed. Conversely, a sustained depressing effect of contraception resulted in the total natural fertility rate decline from 9.35 to about 7.11 for Secondary and Higher Education.

Once again, the total marital fertility rates reduce with the

decreasing proportion of married women due to high education. However, the depressing effect of marriage is very low for those with No Schooling, and Incomplete and Complete Primary Education. Marriage has a significant depressing effect on the fertility of women with Secondary and High Education, which reduces total marital fertility from 7.11 to 5.76.

The relationships between the fertility inhibiting effects of proximate variables and various measures of fertility for Bangladesh by educational subgroups are shown in Figure 3-1.

(1) Little difference between No Education and Incomplete Primary is observed.

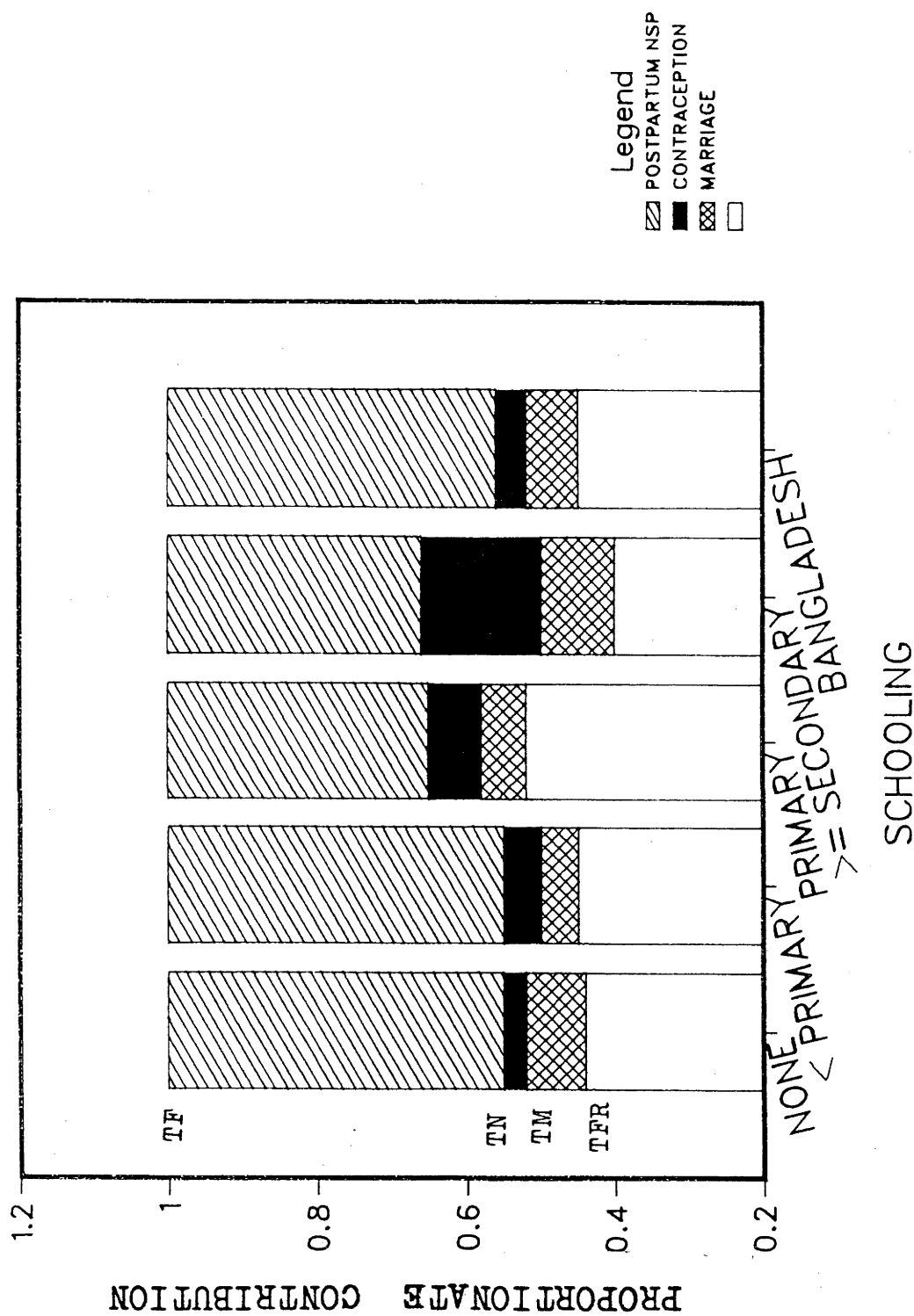
(2) Women with Completed Primary Education have the same pattern of marriage and use a little more contraception, but their NSP is much shorter, hence their TFR is higher than that of less educated women. These are a transitional group.

(3) Women with Secondary and Higher Education marry significantly later and use significantly more contraception. Thus, even though their NSP is a little shorter than that of those who Completed Primary school, their overall fertility is by far the lowest of all educational groups.

In the present study an interesting exception to the monotonic pattern occurs where the No Education group has lower fertility than the Incomplete Primary as well as the Completed Primary Education groups. This finding is consistent with the case of Taiwan (Fernando, 1977: 347). It is also noted that fertility is positively related with Incomplete Primary and followed by Completed Primary Education and a negative relationship is observed in the Secondary and Higher Education group. Thus a pattern of curvilinear relationship occurs between education and fertility. This finding coincides with those of a study of Bangladesh, Indonesia, Kenya and Nepal where women with No Education had lower fertility than those with some education and the pattern of relationship was curvilinear (Rodriguez and Cleland, 1980: 383; United

Figure 3-1:

CONTRIBUTION OF PROXIMATE DETERMINANTS TO DIFFERENCES OF FERTILITY LEVELS BY EDUCATION SUBGROUPS



Note: Figure based on Table 3-6

Nations, 1983: 37). WFS in Ghana, Kenya, Lesotho, Senegal and Sudan also found that the total fertility rate of women with No Schooling was lower than that of women with 1-3 years of schooling (Bongaarts, Frank and Lesthaeghe, 1984: 515).

However, as stated earlier, the purpose of the model is not to provide an estimate of TFRs but to give an approximate breakdown of the contributions made by different variables to levels in fertility. Thus, in conclusion, it can be said that high proportions married play a fertility enhancing role in almost all education groups except the Secondary and Higher Educated group, while duration of NSP plays a dominant role among women with No Education, followed by the Incomplete Primary Education and Completed Primary Education group, but it is very insignificant among women with Secondary and Higher Education. In contrast, prevalence of contraception is grater among Higher Educated women followed by the Completed Primary Education group and very low among women with No Education and Incomplete Primary Education. Thus it is clear that the four proximate determinants act differently in different education groups to reduce the natural level of fertility.

CHAPTER 4

THE EFFECT OF REGIONAL LEVEL OF EDUCATION AND THE OVERALL EDUCATIONAL PROFILE OF AN AREA ON FERTILITY

4.1 INTRODUCTION

The fertility behaviour of human beings is not only the outcome of individual characteristics, since the neighborhood, community or society in which the individual or the couple live may affect their reproductive behavior in interaction with the individual characteristics (Freedman, 1975: 6). It was clear from the preceding analysis that education is an important variable in differentiating the proximate determinants and hence the overall fertility levels of individuals. Nor is it only important for individuals. Caldwell et al (1985), observe that education is overwhelmingly seen as a good thing for the individual, the family, the community and the country. It is also believed that the higher the educational level of a society or community, particularly of women, the lower the likely level of fertility (Khuda, 1982: 197). The education level of the community does not influence the fertility of only the educated group: it also influences the fertility of the uneducated as well as the poorly educated. It is plausible that poorly educated women living in a well educated community may have lower fertility than the national average for their educational class, because in their local community they perceive smaller families, legitimation for limiting fertility and more use and availability of birth control (Freedman, 1975: 8).

This chapter is divided into two sections. Section 1 will focus on the contribution of the regional level of education to overall regional fertility levels through its effect on the proximate determinants of fertility. Section 2 attempts to test the hypothesis regarding the

community effect of education on fertility of women with No Schooling (No Education) living in areas with a different overall level of education. The hypotheses that women with No Schooling living in high education areas will have a lower fertility; and that women with No Schooling living in a low education area will have higher fertility compared to their national average, will be tested.

4.2 THE EFFECT OF THE REGIONAL LEVEL OF EDUCATION ON FERTILITY

Fertility and mortality estimates for Bangladesh by regions are very scarce (Alauddin and Faruquee, 1983:34). A few studies, such as Chen and Chowdhury (1975) and Rabbani et al. (1979) have aimed at determining differences in regional fertility estimated by child-women ratios by divisions/regions. These studies do not consider social and economic factors affecting the fertility of these regions. Moreover, Rabbani et al. (1979) did not explain the variations they found in fertility by divisions.

For administrative purposes Bangladesh has been subdivided into four Divisions; Dhaka, Chittagong, Khulna and Rajshahi. These are sometimes designated as Central, Eastern, Southern and Northern regions, as shown in Figure 4-1.

These four Divisions are sub-divided into districts. Each district is divided into a number of sub-divisions and each subdivision has a number of thanas, both rural and urban and so on. The districts in each Division are shown in Table 4-1.

Although Bangladesh is a fairly homogeneous society, there are some differences in the socio-economic as well as the demographic behaviour between these Divisions.

Figure 4-1: THE GEOGRAPHICAL SETTING OF BANGLADESH
AND ITS FOUR ADMINISTRATIVE DIVISIONS, 1982

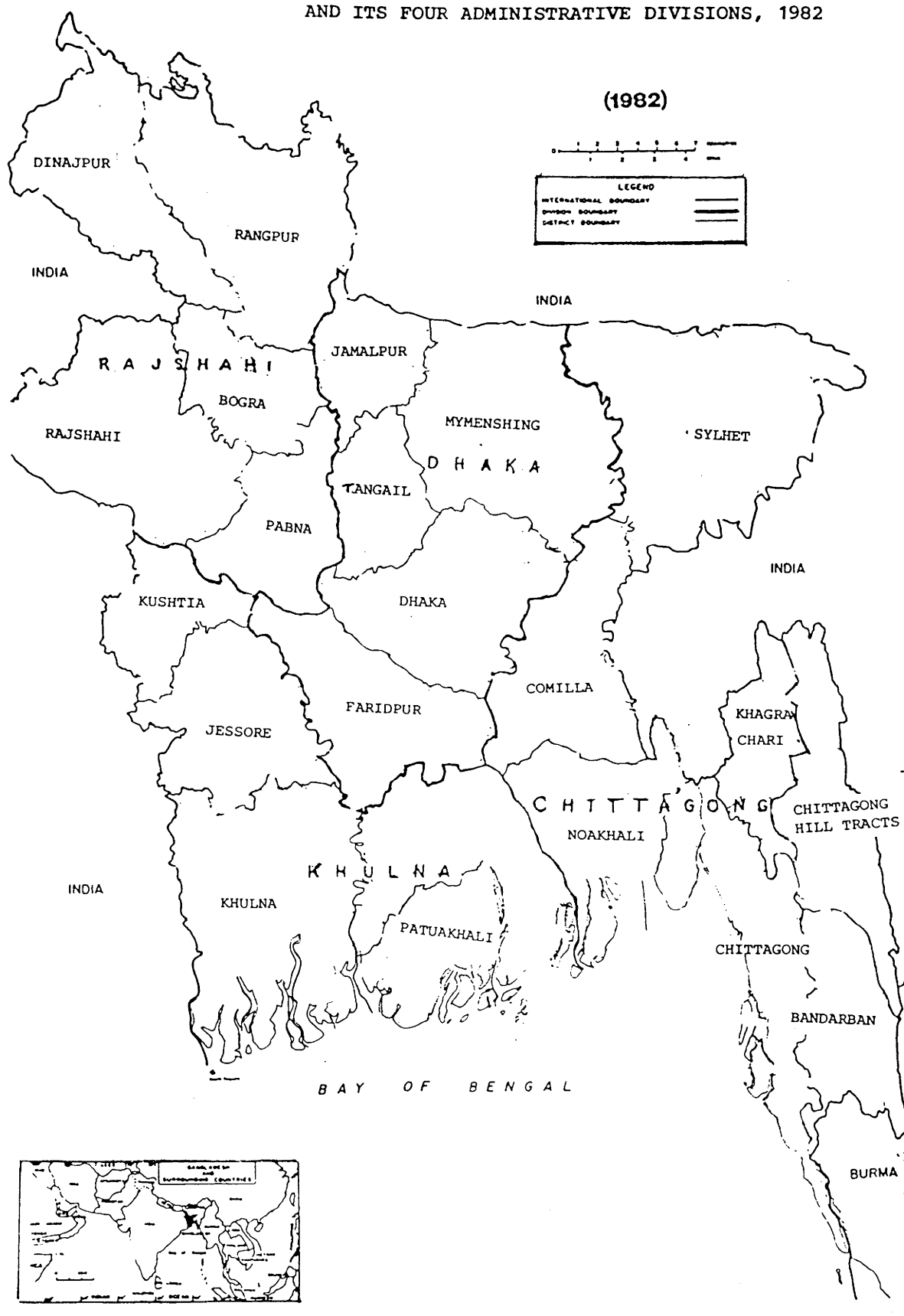


Table 4-1: NAME AND NUMBER OF DISTRICTS UNDER EACH DIVISION

Dhaka Division	Chittagong Division	Khulna Division	Rajshahi Division
Dhaka	Bandarban	Barisal	Bogra
Faridpur	Chittagong	Jessore	Dinajpur
Jamalpur	Chittagong Hill Tracts	Khulna	Pabna
Mymensingh	Comilla	Kushtia	Rajshahi
Tangail	Khagrachari	Patuakhali	Rangpur
	Noakhali		
	Sylhet		

Source: BBS, 1984 : XVI.

4.2.1 THE SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF THE FOUR DIVISIONS

Dhaka Division - (The Central Region)

The Dhaka Division had the largest population, 30 per cent of the total national population and 46 per cent of the country's urban population in 1974. Dhaka city alone contained 58 per cent of the region's total population 1974 (ESCAP, 1981: 30). Historically this city was the centre of factories and trading centres for the Greeks, Portuguese, Dutch, French and English. All administrative, trading, commercial headquarters and educational, health and all other facilities were established in this region. Both government and private investment as well as per capita consumption is much higher in this region than elsewhere. Dhaka conurbation is the main area of concentration, with more than half of the large factories and industries of the country, over two-thirds of the bank credit and an in-flow of the surplus wealth of the rural areas (Rashid, 1981: 206). All this creates opportunities for income, which draws in people from the other regions, especially from the rural areas. Dhaka city contained 59 per cent of all Bangladeshi life-time migrants

in 1974 (ESCAP, 1981: 19). As the seat of Government and educational institutions, Dhaka exhibits the highest population density in Bangladesh, 1020 (2643 in per square mile) in 1974, which was more than twice the national average of 496 (1284 in per square mile) per square kilometre. However, Rashid (1981, 206) observed that the economic activity in Dhaka, enhanced by the glitter of well-lit streets, is in contrast to the backwardness and poverty of nearby villages.

Chittagong Division - (The Eastern Region)

Chittagong division, the second most urbanized, accounted for 26 per cent of the total national population and contained 22 per cent of the country's urban population in 1974. Chittagong city is the dominant urban centre of this region (ESCAP, 1981: 30). It is the principal sea port of the country, the divisional headquarters, and an important trade and commercial centre. Chittagong contained 9 per cent of all Bangladeshi life-time migrants in 1974. This division is geographically distinct, having both hills and flat land, while the rest of Bangladesh is mostly flat. The Chittagong Hill Tracts are tribal areas characterized by sparsely settled hills and forests. These parts of Chittagong division are linguistically and culturally different from the rest of Bangladesh. Even with this large tribal area, Chittagong division has the second highest density with an average of 533 persons per square kilometre (1,433 per square mile). This is largely because of the two densely settled districts of Noakhali and Chittagong. People of this division, especially in the districts of Noakhali, Sylhet and Chittagong are strongly religious.

Khulna Division - (The Southern Region)

The Khulna Division is less urbanized than Dhaka and Chittagong. Although 20 per cent of the total population lived in this region, it contained only 17 per cent of the total urban population in 1974. Khulna city, the third largest city in Bangladesh, is located in this region and has expanded rapidly since 1951. Its expansion in recent years, particularly the 1950s, is because of the location of Chalna port, the

second biggest port in the country, and other secondary industries such as jute, paper, newsprint (ESCAP, 1981: 29-30). Khulna Division had 6 per cent of life-time migrants of the country in 1974. This region has the lowest per capita income in Bangladesh. Despite the economic impact of Khulna city and relatively good access to Dhaka conurbation, income remains low primarily because of relatively low agricultural productivity. The reason for low agricultural productivity is the long period of flooding in some districts, while in others, like Kushtia, low productivity is due to drought rather than to floods (Rashid, 1981: 210). The economic impact of urbanization and industrialization in this region is still very limited.

Rajshahi Division - (The Northern Region)

Rajshahi Division accounted for 24 per cent of the total population of Bangladesh in 1974. This division also experienced an increase in the levels of urbanization as measured by the proportion of people living in larger places. In 1961, Rajshahi division had no urban areas with a population of more than 100,000. By 1974, 14 per cent of the region's urban population were living in cities of this size, but it contained only 15 per cent of the country's total urban population in 1974. Rajshahi city, the major urban area, the administrative headquarters of the region and also a university town, was built in 1956. Rajshahi is flat with good communications and transportation links it with other urban areas. Agricultural development is greater than in the southern region because of increased use of irrigation and chemical fertilizers in the past decades. High-yielding, fertilizer-responsive varieties have been replacing traditional varieties of rice (Arthur and McNicoll, 1978: 32). Without the rice surplus of Dinajpur and some other parts of this region, income would be much lower. The distance of Dinajpur from the capital city and other industrial areas and also the backwardness of industrial development in this region accounts for its being a low density area. Because of the geographical setting, agricultural development and the nearby common borders with India this Division contained of 26 per cent of all life-time migrants in 1974.

From these descriptions it can be seen that the Divisions are large geographical units harbouring a variety of urban and rural areas. For the purpose of this study, these Divisions have been grouped into four broad education categories using "No Schooling" as an index of categorization. The index of proportion with No Schooling, particularly women in the reproductive ages of 15-49 has been chosen to indicate the impact of mass education on each area.

The proportion of females of reproductive age 15-49 years, with No schooling in different Divisions, by place of residence, is shown in the Table 4-2.

Table 4-2: PROPORTION OF ALL WOMEN AGED 15-49 YEARS WITH NO SCHOOLING BY DIVISIONS AND PLACE OF RESIDENCE

Place of residence	Divisions			
	Rajshahi	Khulna	Dhaka	Chittagong
Urban	.49 (267)	.61 (289)	.56 (782)	.62 (406)
Rural	.83 (1270)	.71 (1203)	.81 (1421)	.76 (1513)

Source :Bangladesh Household Survey Data Tape, 1976.

The country is now grouped into four education areas as shown in Table 4-3, are ranked into education levels based on the proportions shown in Table 4-2.

The effect of areal education on each proximate determinant in the different areas will be discussed next, and the index values for each determinant will be obtained using the methods of the third chapter.

Table 4-3: CLASSIFICATION INTO EDUCATION AREAS

Area	Education Category	Regions	Proportion with No Schooling
Area 1	High Education Area	Urban Rajshahi Urban Dhaka	.52 (1049)
Area 2	Moderate Education Area	Urban Khulna Urban Chittagong	.62 (695)
Area 3	Low Education Area	Rural Khulna Rural Chittagong	.74 (2716)
Area 4	Lowest Education Area	Rural Rajshahi Rural Dhaka	.81 (2691)

Source: Based on Table 4-2.

4.2.2 THE INDEX OF MARRIAGE = C_m

This section focuses on the difference in marriage patterns between the four education areas and the effect of education on the proportion married. Using Equation 2 from chapter 3, the proportion of all women who are currently married for areas is obtained and the index of marriage, C_m , is shown in Table 4-4.

The higher number of educated women in an area is likely to decrease the proportion of women marrying of that area. For example, the High Education Area, Area 1, exhibits the lowest proportion of women currently married. This proportion gradually increases from 0.79 in Area 1 to 0.87 in Area 4 (see Table 4-4). Thus a negative relationship between overall educational level and pattern of marriage is observed.

These differences may be due to comparatively late age at marriage and more prevalent of marital disruptions in Areas 1 and 2, the urban areas of the country, where more educational opportunities for women tend to lead to later age at marriage. In Areas 3 and 4, the rural areas, the higher C_m values may be because of early age of marriage as well as universality of marriage, because of less opportunity to obtain an education.

Table 4-4: THE Cm VALUES AND THE CORRESPONDING OBSERVED
TOTAL FERTILITY RATE (TFR) AND TOTAL MARITAL FERTILITY RATE
(TM) BY AREAS

Area	Education category	Observed		Index of * Cm
		TFR	TM	
Area 1	High	5.82	7.37	0.79
Area 2	Moderate	6.20	7.69	0.81
Area 3	Low	6.21	7.36	0.84
Area 4	Lowest	6.42	7.42	0.87
	Bangladesh	6.35	7.39	0.86

$$* \text{ Cm} = \frac{\text{TFR}}{\text{TM}} \quad (\text{see Chapter 3, Equation No. 2})$$

Source: BFS Data Tape, 1976.

Shahidullah (1979) found that the capital city, Dhaka, seems to have the latest age at marriage and slowest tempo at which marriage takes place. Urban size therefore seems to influence age at marriage. Table 4-4 suggests that not only urban size but also a higher overall education level of the area are associated with later age at marriage, resulting in a lower proportion of currently married women.

4.2.3 INDEX OF POSTPARTUM NON-SUSCEPTIBILITY = Ci

This section looks at the contribution of mean duration of NSP (i), to differences in the overall fertility level. The i is obtained from Equation 4 (see Chapter 3) and the index values against each i value are obtained by Equation 3 (Chapter 3) for each education area. Both these values are shown in Table 4-5.

The top panel of Table 4-5 shows the mean duration of NSP (i), among education areas using three different reference periods. As stated earlier, three reference periods have been used to check consistency. The duration of i varies between areas from about 13 months to 18

Table 4-5: THE MEAN DURATION OF NSP (i),
IN MONTHS AND THE CORRESPONDING Ci VALUES BY AREAS

Areas	The Mean Duration of NSP (i)		
	24 months *	36 months *	48 months *
Area 1	12.52	12.90	13.19
Area 2	13.58	13.76	13.72
Area 3	16.84	16.60	16.64
Area 4	18.36	18.21	18.18
Bangladesh	17.20	17.06	17.08

Area	Index of Ci		
Area 1	0.64	0.64	0.63
Area 2	0.62	0.62	0.62
Area 3	0.57	0.57	0.57
Area 4	0.54	0.54	0.55
Bangladesh	0.56	0.56	0.56

* Reference period to estimate incidence.
Source : BFS Data Tape, 1976.

months, irrespective of the length of the reference period. Furthermore, the higher the overall level of education in an area, the lower the value of i. Earlier research has shown that postpartum amenorrhoea and postpartum abstinence tend to be shorter in urban areas (Gaisie, 1984: 29). However, the differences between Areas 1 and 2, and between Areas 3 and 4 may be attributed to the effect of education in these areas. The lower panel of Table 4-5 shows the values of the index of NSP, Ci. This index falls with the level of education in each Area.

4.2.4 INDEX OF CONTRACEPTION - Cc

This section examines how the overall educational level of an area is related to the increase in the use of contraception of that area. The proportion of women using different contraceptive methods by area and the method specific use-effectiveness is shown in Table 4-6, which

Table 4-6: PROPORTION OF ALL WOMEN WHO ARE USING
CONTRACEPTIVE METHOD, $u(m)$, BY AREAS AND THE METHOD
SPECIFIC USE-EFFECTIVENESS, $e(m)$

Name of Method	$u(m)$					$e(m)$
	Area 1	Area 2	Area 3	Area 4	Bangla -desh	
Pills	.098	.087	.025	.025	.030	0.90
IUD	.003	.000	.005	.004	.004	0.95
Sterili -zation	.039	.008	.005	.008	.009	1.00
Others	.065	.055	.048	.034	.041	0.70
u	.205	.150	.083	.071	.084	

u = Proportion currently using contraception among married women aged 15-49.

Source :BFS Data Tape, 1976.

illustrates the pattern of use of modern methods of contraception by the overall education level of different areas. For pills the highest values are observed in Area 1, where most women are educated, followed by gradually declining percentages. The use of the IUD does not show a gradually increasing pattern as the number of educated women increase. The pattern of sterilization varies in different areas, although the prevalence is considerable in Area 1. The use of other methods monotonically declines from Area 1 to Area 4. From the above discussion it is clear that Area 1, the high education area, had a higher proportion of women using contraception irrespective of method (except IUD). The other areas have monotonically declining percentages with the decline in the proportion of educated women.

The e , the average use-effectiveness of contraception by areas, is obtained by Equation 6 and the corresponding index values of C_c are obtained by Equation 5 (see Chapter 3). Both are shown in Table 4-7.

Table 4-7: THE AVERAGE USE-EFFECTIVENESS, e , AND THE CORRESPONDING INDEX VALUES C_c BY AREAS

Area	e	C_c
Area 1	0.853	0.816
Area 2	0.833	0.866
Area 3	0.807	0.930
Area 4	0.831	0.937
Bangladesh	0.821	0.926

Note: See chapter 3 for Equations 5 and 6.
Source : BFS Data Tape, 1976.

From Table 4-7 it is evident that the higher the proportion of women with schooling in an area the higher the average use-effectiveness of contraception. A positive relationship is observed between the two. For the index of C_c , lower values indicate greater protection through contraception. Areas 1 and 2 have a higher average use-effectiveness of contraception and greater prevalence than Areas 3 and 4.

4.2.5 DECOMPOSITION OF CHANGES IN FERTILITY

The difference in overall level of fertility between a population and its sub-groups, or regions of the country, is caused by the difference in one or more proximate determinants. Equation No.1 (see chapter 3), allows the quantification of the contribution made by each proximate determinant to a given difference in fertility by area. The summary estimates of the indices and the model estimates of the Total Fertility Rate, TFR, are shown in Table 4-8.

Table 4-8 illustrates that Area 1, the High Education Area, achieved the lowest TFR of the four areas. Overall fertility was lower because of the proportion married and the effective use of

Table 4-8: THE INDEX VALUES AND THE MODEL ESTIMATES OF
TFR BY AREA

Area	Index of Marriage	Index of NSP	Index of Contra- ception	Index of abortion	Total Fecun- -dity	Total Fertility Rates	
	(Cm)	(Ci)	(Cc)	(Ca)	(TF)	Model	Observed
Area 1	0.79	0.63	0.82	1.00	14.17	5.78	5.82
Area 2	0.81	0.62	0.87	1.00	14.17	6.19	6.20
Area 3	0.84	0.57	0.93	1.00	14.17	6.31	6.21
Area 4	0.87	0.55	0.94	1.00	14.17	6.37	6.42
Bangla -desh	0.86	0.56	0.93	1.00	14.17	6.35	6.35

Model TFR = $C_m \times C_i \times C_c \times C_a \times TF$ (see Chapter 3, Equation No.1)
Source: BFS Data Tape, 1976.

contraception, although it had a very short duration of NSP. The fertility enhancing effect of short NSP was offset by delayed marriage and significant contraceptive use.

On the other hand, Area 2, the Moderate Education Area, had higher fertility compared to Area 1, with a slightly higher proportion married and much lower use of contraception, even though the duration of NSP was almost the same as that in Area 1.

Areas 3 and 4 had higher overall fertility with the lowest proportion married and ineffective use of contraception, although they had a very long duration of NSP.

Table 4-8 also reveals that there is good agreement between model and observed fertility levels. Except for Area 3, the model and the observed TFR are very close. In Area 3 the model estimate of TFR is slightly higher than the observed, which may be because of reporting errors or other reasons as stated by Bongaarts (see section 3-8, Chapter 3). However, the overall fit of the model is quite close and good.

Table 4-9: ESTIMATES OF DIFFERENT FERTILITY LEVELS BY AREA
IMPLIED BY THE MODEL

Fertility Levels	Area 1	Area 2	Area 3	Area 4	Bangladesh
Total Fecundity Rate TF	14.17	14.17	14.17	14.17	14.17
Total Natural Fertility Rate $TN = C_i \times TF$	8.93	8.79	8.08	7.79	7.94
Total Marital Fertility Rate $TM = C_c \times C_a \times TN$	7.32	7.65	7.51	7.32	7.38
Total Fertility Rate $TFR = C_m \times TM$	5.78	6.19	6.31	6.37	6.35

Source : Based on Table 4-8.

Table 4-9 shows the contribution of each variables to the determination of actual levels of fertility. Each area is assumed to have an average Fecundity Rate TF of 14.17 (as estimated in Chapter 3). The table exhibits the general relationship between proximate determinants and different fertility levels. As can be seen from Table 4-9 and also Figure 4-1, the index NSP, C_i , has a greater inhibiting effect on fecundity, TF. It reduces the level of TF by 30 , 40, 45 and 47 per cent in Areas 1, 2, 3 and 4 respectively, although the difference between Areas 3 and 4 is very small. This Table also illustrates that the duration of NSP declines as education increases. The Total Natural Fertility, TN, is inversely related to the average duration of NSP as well as the overall education of the area. It decreases from 8.93 to 7.79 births per women from Areas 1 to 4 as the duration of the NSP extends (see Table 4-5).

Although the TN is higher in Area 1 the Total Marital Fertility, TM, declines more in this area. The reason is clearly a higher contraceptive prevalence of about 20 per cent accompanied by a higher

contraceptive use-effectiveness of about 0.85 (see Table 4-5). On the other hand, Area 2 shows fairly high use of contraception and TM values are the highest of all areas, as the increase in the practice of contraception only barely compensates for the fertility-inhibiting impact of a shortened duration of NSP. Conversely, Areas 3 and 4, having insignificant use of contraception, had lower TM values compare to Area 2 because of the long duration of NSP.

Finally, the TFR increases from 5.78 to 6.37 between Area 1 and Area 4 not only because of the decline in marital fertility but also because C_m , the proportion of currently married women, declines from 0.87 to 0.79. This is largely the result of a higher mean age at marriage of women in Area 1, the High Education Area.

The extent of the contribution of each proximate determinant to overall fertility in each area is portrayed in Figure 4-2.

It is clear that:

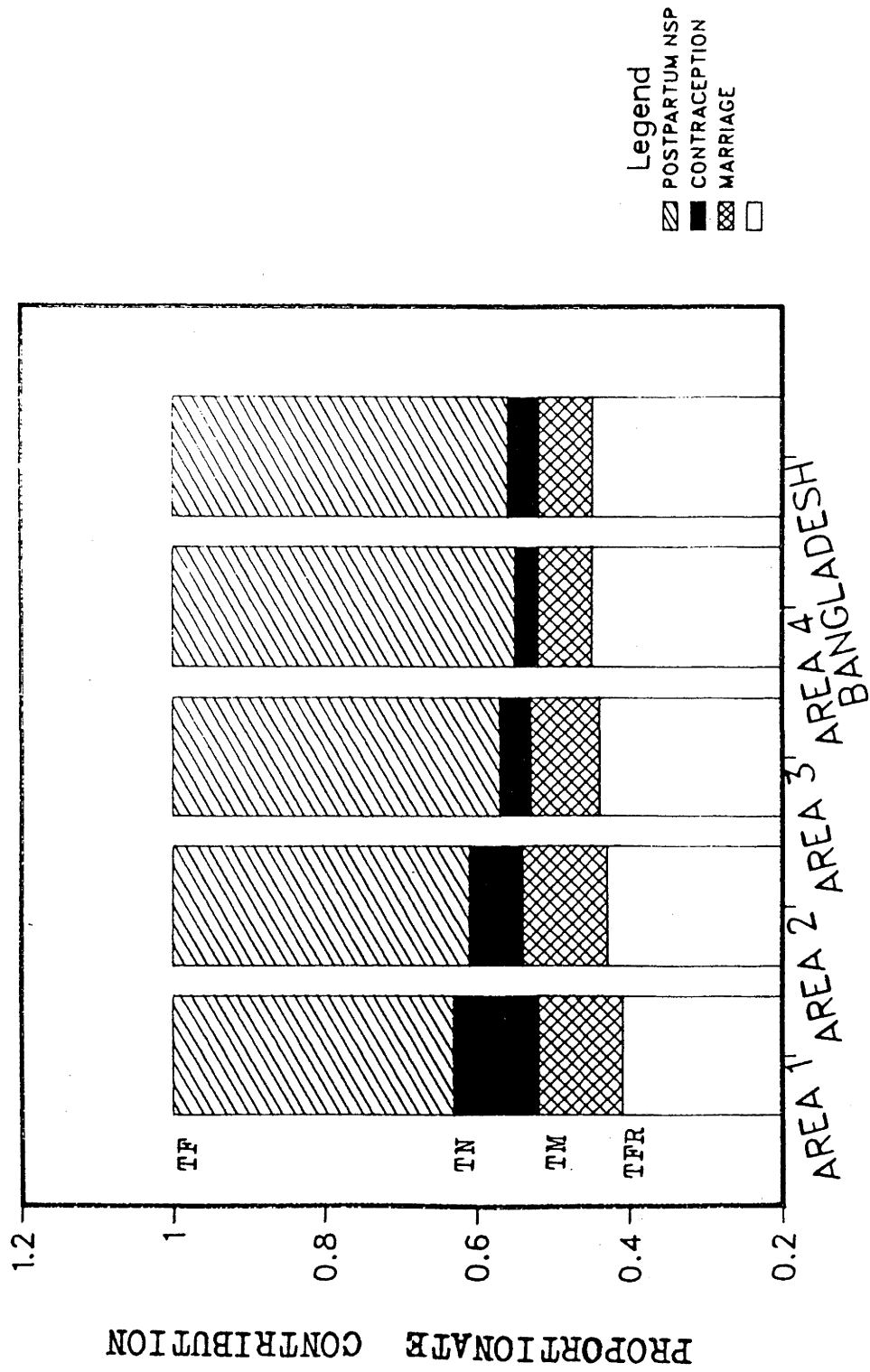
(1) Area 1 has the lowest fertility of all areas with much delayed marriage and significant use of contraception, even though the duration of NSP is much shorter.

(2) Area 2 has higher fertility than Area 1, with a slightly higher proportion married and lower use of contraception and almost the same duration of NSP.

(3) Areas 3 and 4 exhibit almost the same pattern of association between the proximate determinants and overall fertility. Area 3 has a higher proportion married followed by Area 4. Both have an almost insignificant use of contraception even though duration of the NSP is considerably longer in these areas, resulting in higher fertility compared to Areas 1 and 2.

Figure 4-2:

CONTRIBUTION OF PROXIMATE DETERMINANTS
TO DIFFERENCES OF FERTILITY LEVELS
BY EDUCATION AREAS



EDUCATION AREAS

Note: Figure based on Table 4-9

Area 1, which has a higher proportion of women with education, has lowest fertility of all followed by Area 2. Areas 1 and 2 are urban areas and above all the differences between these two areas are because of the difference in the proportion of women with schooling. The same is true for Areas 3 and 4, although these are rural and have high fertility. Thus it can be concluded that the fertility differentials among areas is related to variations in the proportion of women with schooling, and the pattern of association between these two are usually inverse.

4.3 THE EFFECT OF OVERALL EDUCATION PROFILE OF AN AREA ON FERTILITY

The focus of this section is on whether the fertility of individuals is affected not only by their own education but also by the educational profile of the area where they live, particularly, women with No Education (No Schooling) living in the four areas with different levels of overall education [see Table 4-3]. Women with No Education, which means women who have no western education, will be called "Uneducated Women". This section will look at the Uneducated Women of Areas 1, 2, 3 and 4 and examine how their total fertility differs from the national average of this group, through the variations in the proximate determinants. The following discussion will be use the index of proximate determinants of fertility of Uneducated Women in the four education areas.

4.3.1 THE INDEX OF MARRIAGE = C_m

The observed TFR and TM values from which the index of marriage, C_m , is derived for each area are shown in Table 4-10. The index of marriage, C_m , in the four areas shows the depressing influence of overall education level of the area on the marriage pattern of Uneducated Women. The fertility-reducing impact of marriage is greater among Uneducated Women in Area 1, followed by Area 2, than in Areas 3 and 4. The education level of these women is the same (No Schooling) even though the proportion married varies while they reside in areas with different overall level of education. This is largely the

Table 4-10: THE INDEX OF MARRIAGE (Cm) AND THE CORRESPONDING
TOTAL FERTILITY RATE (TFR) AND THE TOTAL MARITAL FERTILITY
(TM) AMONG UNEDUCATED WOMEN BY AREAS

Area	Education Level of Area	Observed		Index of Cm
		TFR of Uneducated Women	TM	
Area 1	High	6.00	7.65	0.78
Area 2	Moderate	6.49	8.09	0.80
Area 3	Low	5.83	6.94	0.84
Area 4	Lowest	6.42	7.42	0.87
Bangladesh		6.25	7.39	0.85

Source :BFS Data Tape, 1976.

consequence of different in education levels in each area (see Table 4-3).

4.3.2 THE INDEX OF POSTPARTUM NON-SUSCEPTIBILITY = C_i

The mean duration of the NSP (i) and the index of C_i for Uneducated Women in each education area can be seen in Table 4-11.

It is interesting that in the top panel of Table 4-11, even though the respondents have no education, they do not have the same mean duration of i . It appears that they are influenced by the education of others where they reside and show a shortening of duration of breastfeeding and/or abstinence with the education level of the area. Areas 1 and 2 show some community effect of education on i of Uneducated Women of these areas. These difference in i are also revealed in the index value of C_i , as shown in the lower panel of Table 4-11.

Table 4-11: THE MEAN DURATION OF NSP (i) IN MONTHS AND THE CORRESPONDING Ci VALUES AMONG UNEDUCATED WOMEN BY AREAS

Area	Mean Duration of NSP (i)		
	24 months *	36 months *	48 months *
Area 1	15.27	15.11	14.84
Area 2	15.38	15.32	15.25
Area 3	19.03	18.16	18.05
Area 4	19.13	18.62	18.45
Bangladesh	18.87	18.13	18.04

Area	Index of Ci		
	24 months *	36 months *	48 months *
Area 1	0.59	0.60	0.60
Area 2	0.60	0.59	0.59
Area 3	0.53	0.55	0.55
Area 4	0.53	0.54	0.54
Bangladesh	0.54	0.55	0.55

*Reference period to estimate the incidence.
Source :BFS Data Tape, 1976.

4.3.3 THE INDEX OF CONTRACEPTION = Cc

There is a large decline in u, the proportion of married women currently using contraception [see Table 4-12], with successive increments in the education level of areas, the net result being a very wide range in index values across the areas, although the level of education of the women under consideration is the same. It is interesting to note that the use of contraception among Uneducated Women residing in Area 1 is considerably higher compared to the three other areas, which may be a consequence of the community level of education rather than the individual's own education. The same pattern can be seen in e, the use-effectiveness of contraception, as well as in the index of Cc [see Table 4-13].

Table 4-12: PROPORTION OF WOMEN USING CONTRACEPTIVE METHOD, $u(m)$, AND THE METHOD SPECIFIC USE-EFFECTIVENESS, $e(m)$, AMONG UNEDUCATED WOMEN BY AREAS

Name of Method	$u(m)$					* $e(m)$
	Area 1	Area 2	Area 3	Area 4	Bangla -desh	
Pills	.070	.016	.012	.019	.016	0.90
IUD	.006	.000	.002	.004	.003	0.95
Sterili- zation	.023	.008	.003	.008	.006	1.00
Others	.035	.023	.020	.026	.017	0.70
u	.134	.047	.037	.057	.051	

u = Proportion of currently using contraception among married women aged 15-49.

* see Section 3.6, Chapter 3.

Source: BFS Data Tape, 1976.

Table 4-13: THE AVERAGE USE-EFFECTIVENESS, e , AND THE INDEX VALUES C_c AMONG UNEDUCATED WOMEN BY AREAS

Area	e	C_c
Area 1	0.873	0.877
Area 2	0.808	0.958
Area 3	0.810	0.968
Area 4	0.824	0.949
Bangladesh	0.824	0.954

Source: BFS Data Tape, 1976.

The index of C_c for Area 1 is a low 0.88, which indicates a higher use of contraception. C_c values for the other three areas are very close

and much higher than Area 1, showing an insignificant use of contraception. From this analysis it is clear that only in Area 1 are Uneducated Women influenced by educated women more than by their own education level. These women might also be influenced by the urban amenities, the proximity of clinics, and the effect of an active family planning programmes. These three areas show the usual pattern of prevalence of contraception of Uneducated Women.

4.3.4 DECOMPOSITION OF CHANGES IN FERTILITY

Thus far, the effect of the education profile of areas on the proximate determinants has been examined largely in isolation for Uneducated Women living in these areas. A summary estimate of all proximate determinants and the model estimate of Total Fertility Rate (TFR) are shown in Table 4-14.

Table 4-14: ESTIMATES OF INDEX VALUES AND THE MODEL ESTIMATES OF TFR FOR UNEDUCATED WOMEN BY EDUCATION AREAS

Area	Index of Marriage	Index of NSP	Index of Contr-ception	Index of abortion	Total Fecun-dity	Total Fertility Rates	
	(Cm)	(Ci)	(Cc)	(Ca)	TF	Model	Observed
Area 1	0.78	0.60	0.88	1.00	14.17	5.83	6.00
Area 2	0.80	0.59	0.96	1.00	14.17	6.42	6.49
Area 3	0.84	0.55	0.97	1.00	14.17	6.35	5.83
Area 4	0.87	0.54	0.95	1.00	14.17	6.32	6.41
Bangla-desh	0.85	0.55	0.95	1.00	14.17	6.29	6.25

Source : BFS Data Tape, 1975.

In comparing the model estimates of TFR throughout the areas it is clear that Uneducated Women in Area 1 have the lowest TFR of all areas, 5.83, and this TFR is also lower than the national average for their

education class, which is 6.29. These women might perceive that many of their neighbours are better educated, living in better circumstances, have smaller families and use more contraception. This perception might change their traditional values of early and universal marriage and the value of more children. It might also motivate them to delay marriage and to use more contraception, and as a consequence they achieve lower fertility, although they are undergoing a process of shortening of the duration of NSP. This finding coincides with the findings of Rodesh (1971) and Anker (1975).

In contrast, uneducated women in Area 2 have the highest total fertility. This may be because these women had almost the same pattern of marriage and duration of NSP, but simultaneously they did not use contraception as much as their educated neighbors.

The total fertility rates for Uneducated Women in Areas 3 and 4 are high and very close. The pattern of association between proximate determinants and TFR for these two areas are almost the same. However, the total fertility of Uneducated Women in Areas 2, 3 and 4 supports the hypothesis that Uneducated Women may have higher fertility in a low education area.

Table 4-14 also allows comparison of the model TFR with the observed TFR. Except in Area 3, the agreement between these two TFRs, is quite close and the model fits well. Area 3 does not show a close association between the two TFRs with the observed TFR much lower than the model. This may be due to the measurement error of the indices or may be the assumption of constant Ca and TF values for each area with different overall level of education.

This section of the analysis will consider levels of fertility and the contribution made by each index. Estimates of different fertility levels of Uneducated Women in the four areas and the contribution of each determinant to variations in fertility levels are shown in Table 4-15 and in Figure 4-3.

Table 4-15: ESTIMATES OF DIFFERENT FERTILITY LEVELS
FOR UNEDUCATED WOMEN BY EDUCATION AREAS

Fertility Levels	Area 1	Area 2	Area 3	Area 4	Bangla -desh
Total Fecundity = TF	14.17	14.17	14.17	14.17	14.17
Total Natural Fertility Rate $TN = C_i \times TF$	8.50	8.36	7.79	7.65	7.79
Total Marital Fertility Rate $TM = C_c \times C_a \times TN$	7.48	8.03	7.56	7.27	7.40
Total Fertility Rate $TFR = C_m \times TM$	5.83	6.42	6.35	6.32	6.29

Source :BFS Data Tape, 1975.

The first row of the table gives the Total Fecundity, TF, that would result if the three proximate determinants had no impact. This TF value is reduced by the increasing duration of NSP. This duration of NSP shortens with the increase of the overall education level of the area instead of the respondents own education. Therefore, a decreasing pattern of TN is observed. The longest duration of NSP is found for women in Areas 3 and 4, which is quite usual for Uneducated Women, but the duration is shorter in Areas 1 and 2. This result suggests that Uneducated Women in Areas 1 and Area 2 are influenced by the educated women's breastfeeding or abstinence practices.

TN is further reduced by the effect of contraceptive practice. Uneducated Women of Area 1 control their TN of 12 per cent by using effective contraception, while Areas 2, 3 and 4 show insignificant use of contraception, which reduces TN by only a very minimum amount. These three areas show the usual pattern of contraceptive practice of Uneducated Women. Women in Area 1 are motivated by neighboring educated women and they give up their traditional values of practice of contraception and use more modern contraception.

TM is reduced by delayed marriage, which is effective for Uneducated Women in Area 1 and followed by Area 2, where TN is reduced from 7.48 to a TM value of 5.98 and from 8.03 to 6.42 respectively. The reducing effect of marriage declines with the increase in the proportion of Uneducated Women in the area, for example, Area 3 followed by Area 4).

However, Area 1 showed a negative effect of overall education on the fertility of Uneducated Women, while Area 2 shows the opposite. The effect of the overall education level on uneducated women of Areas 3 and 4 is very difficult to ascertain due to conflicting trends.

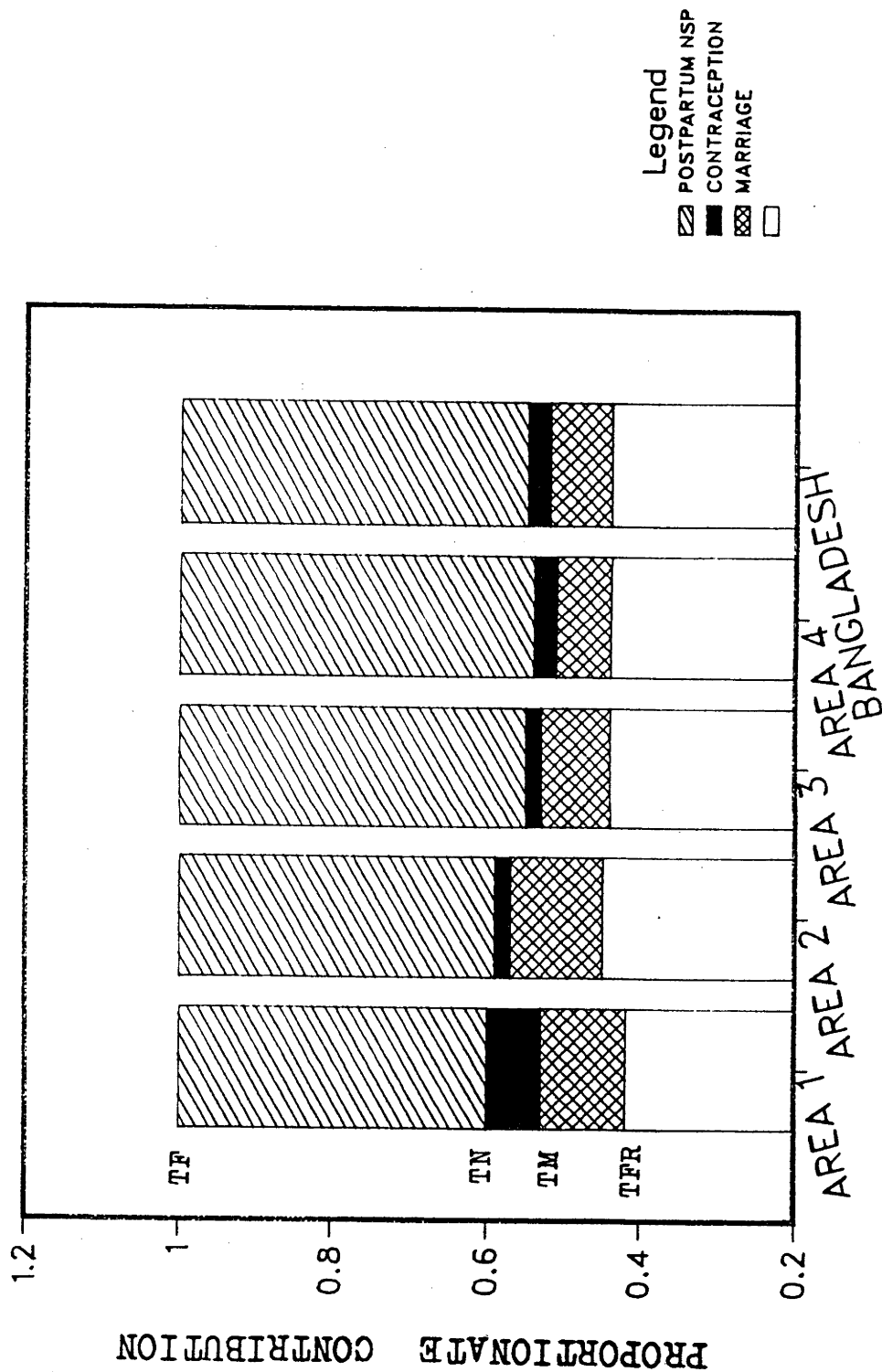
The levels of fertility and the contribution of each proximate determinant are portrayed in Figure 4-3.

The figure indicates that:

- (1) In Area 1, to some extent, Uneducated Women experienced delayed marriage and fairly high effective use of contraceptive methods. Furthermore, these women have shorter durations of NSP resulting in lower level fertility. The proximate determinants in Area 1 are affected by other's education instead of the individual's own education.
- (2) In contrast, Uneducated Women in Area 2, have the highest fertility level. This is attributed to an insignificant practice of contraception, while the pattern of other proximate determinants is almost the same as Area 1.
- (3) On the other hand Areas 3 and 4 show almost the same pattern of association between proximate determinants and overall fertility. Uneducated Women in these areas have a similarly longer duration of NSP, a higher proportion married and very little use of contraception. However, the pattern of association they show is not unusual compared to the national average of the No Schooling group, as shown in the right section of the figure.

Figure 4-3:

CONTRIBUTION OF PROXIMATE DETERMINANTS TO
DIFFERENCES OF FERTILITY LEVELS OF
UNEDUCATED WOMEN BY EDUCATION AREAS



EDUCATION AREAS

Note: Figure based on Table 4-15

So far, the above analysis illustrates that although the women concerned here have the same level of education i.e. No Schooling, they are not behaving in the same way when they live in areas with a different overall education level and some effect of the community level of education on the fertility of Uneducated Women living in Area 1 is evident. This section has focussed on quantifying the influence of areal overall education on Uneducated Women's fertility in the different education level areas. The effect of regional education on the fertility of women with 1-3 years of education living in these areas could not be meaningfully discussed because, unfortunately, the cell sizes in Areas 1 and 2 were very small, and moreover, the observed TFR became considerably higher than the model TFR in these areas. However, the contribution of the proximate determinants to the model TFR and their association with the education level of the areas suggests almost the same pattern as the Uneducated group. However, because of too few cases the analysis of this education group could not be provided.

It would be interesting if this type of analysis could be done for women with 1-3 years, 4-6 years and 7+ years of schooling. It is very difficult to make any hypothetical statement about the effect of the overall education level of the area on the fertility of those with 1-3 years of education, the Incomplete Primary Education group. But for the Completed Primary group, 4-6 years of education, and the Secondary and Higher education group, with 7 + years, the hypothesis is likely to be reversed, compared to the No Schooling group. For example, fertility of women with Completed Primary and Secondary and Higher Education would be expected to be lower even if they lived in a lower education area.

CHAPTER 5

SUMMARY AND CONCLUSION

The importance of education in the demographic life of an individual as well as the region/area of a country is beyond controversy. In some of the developing countries education has not yet reached top priority in the development effort, hence educational attainments at different levels are very poor, resulting in a poor demographic situation.

In Bangladesh like some other developing countries, female education is neglected. The latest census, 1981, found that only 16.8 per cent of females had attended school, compared to 26.8 per cent of males. It also revealed that among educated women, 75 per cent had primary education, while only 19.8, 4.5 and 0.7 per cent had secondary, higher secondary and graduate and above education respectively (BBS, 1984: 89-90).

This analysis has illustrated the ways in which differential education is linked to differential fertility, it also investigated the mechanism through which education operates on fertility differentials. The Bongaarts model of the proximate determinants of fertility has been used to determine the effect of education in limiting fertility and inhibiting the proximate determinants at the individual and at the regional levels.

At the Individual Level

The analysis focused first on the effects of the individual's education on fertility. Regarding the hypothesis, the study observed the variation in the overall fertility between women comes through differences in the proximate determinants due to differences in the

level of education (see Table 3-5, Chapter 3). Women with No Education and with Incomplete Primary Education have almost similar levels of overall high fertility with almost the same pattern of proximate determinants. That is a higher proportion married, insignificant use of contraception and longer duration of postpartum non-susceptibility (NSP). On the other hand, women with Completed Primary Education have higher fertility than women with No Education or Incomplete Primary Education. The mechanism which keeps their fertility is the shorter duration of NSP, and it has not controlled by marriage and contraception.

In contrast, women with Secondary and Higher Education have the lowest fertility of all education groups. The fertility-enhancing effect of the shorter NSP of this group was offset by the fertility-inhibiting effect of delayed marriage and significant use of contraception. Thus the findings that different education groups have different fertility, support the validity of the hypothesis.

At the Regional Level

The effect of regional level education on a region's fertility was analyzed by dividing Bangladesh into four education areas with different overall levels of education (see Table 4-3, Chapter 4). The analysis found that the higher the number of women educated in an area the lower the fertility of that area, and the overall fertility increases as the proportion of educated women falls.

Area 1, the High Education Area had the lowest fertility of all education areas. The higher overall education of this area kept the fertility lower through introducing delayed marriage, hence a lower proportion married and effective use of contraception. These two determinants controlled the fertility-enhancing effect of a shortened the duration of NSP in this area.

Area 2, the Moderate Education Area, had higher fertility. The fertility inhibiting effect of marriage and contraception were very low

compared to Area 1, while the pattern of the NSP was almost the same as in Area 1.

On the other hand, Area 3, the Low Education Area had higher total fertility as the proportion of educated women fell and followed by Area 4. The effect of proximate determinants of overall fertility levels of Areas 3 and 4 were very similar, with higher proportions married, insignificant use of contraception and longer durations of NSP.

It is noted here that Areas 1 and 2 are urban areas and Areas 3 and 4 are the rural areas of the country. However, the pattern of association between proximate determinants and overall fertility in urban areas, Areas 1 and 2 varies as a consequence of the difference in overall education in these areas and the same holds true for the rural areas, Areas 3 and 4.

While examining the effect of community level education on fertility of Uneducated Women (women with No Education), the study found differences in fertility between these women while they were living in different education areas even though they had the same level of education (see Table 4-14, Chapter 4). The effect of community level education was significant in Area 1, where the proximate determinants as well as overall fertility of women were influenced by the education of the community rather than their own education. Therefore, in Area 1 the Uneducated Women have lower fertility than the national average for this group. In contrast, the overall fertility for Uneducated Women in Areas 2, 3 and 4 is higher than their national average. Thus some effect of community level education was found in Area 1, and the hypothesis was supported in this Area, but not in the remaining areas.

The difference in levels of fertility among education subgroups and education areas persist due to the difference in education. Education tends to reduce the duration of breastfeeding and/or the practice of postpartum abstinence, which raise the natural fertility among Higher Education subgroups and areas, because of its positive effect through the reducing the length of NSP. However, education has a substantial

negative effect, as it reduces exposure by raising age at marriage and increasing the prevalence of contraception which offsets the positive effect (see Table 3-6, Chapter 3 and Table 4-9, 4-15, Chapter 4).

The effects of education on proximate determinants and overall fertility levels of education subgroups and areas do not follow the same pattern. Higher education at individual and at regional levels ensured as an important effect on fertility but in a country like Bangladesh regional education would be expected to be more important than individual education. It is seen in the foregoing analysis that the effect of a few people's education can reduce the fertility of that group, but its overall effect on the country's demographic prespective was negligibel as their proportion is so small. However, the Bongaarts model gives the picture of proximate determinants at the aggregate level and does not permit the investigation of interrelationship between these variables at the age-specific level, which could be an area for further research.

This thesis attempted to quantify the relation between educational levels and the proximate determinants of fertility. It has provided some insight into the comparative effect of individual and community level education on the fertility of the population of Bangladesh, which will be an important issue in prospective policy.

In view of the above findings, the Government of Bangladesh should realize the the impact of expansion of educational opportunities, particularly for girls, at least up to the secondary level which in turn will increase the age at marriage of females and promote accurate perception towards their fertility (Oni, 1985:330). Such secondary education would need to receive greater share of the national budget. Simeltaneously, population education and family planning may be introduced into the curriculam at all levels of education so the realization of the population problem would in turn be at the mass level. The vigorous parental education, which stresses the the importance of longer duration of breastfeeding, especially for the health of baby and its impact on fertility should be introduced (Oni,

1985:330). The proposed recommendations are to achieve the population target and their success depends upon the full operationalization of the programmes.

REFERENCES

- AHMED, B.
1978 "Differential Fertility in Bangladesh", Unpublished M.A Thesis, Canberra, Australian National University.
- AHMED, N.
1968 An Economic Geography of East Pakistan, London, Oxford University Press.
- ALAM, I. and J. B. CASTERLINE
1984 Socio-Economic Differentials in Recent Fertility, Comparative Studies, Cross-National Summaries. No. 33. Netherland, International Statistical Institute.
- ALAUDDIN, M. and R. FARUQUE
1983 "Population and Family Planning in Bangladesh", World Bank Staff Working Papers, No. 557, Washington, World Bank.
- ANKER, R. B.
1973 "Socio-Economic Determinants of Reproductive Behaviour in Households of Rural Gujarat", India, Unpublished PhD thesis, Michigan, University of Michigan(Microfilm).
- ANON
1984 "Spotlight", Population Today, Vol. 12, No. 6, pp 1-12.
- ARTHUR, W.B. and G. MCNICOLL
1978 "An Analytical Survey of Population and Development in Bangladesh", Population and Development Review, Vol. 4, No. 1, pp 23-80.
- BANGLADESH BUREAU OF STATISTICS (BBS)
1981 Statistical Yearbook of Bangladesh. Statistical Division, Ministry of Planning, Government of The People's Republic of Bangladesh, Dhaka.
- 1984 Bangladesh Population Census, 1981: An Analytical Findings and National Tables, Dhaka, Government of The Peoples Republic of Bangladesh.
- BOGUE, D. J.
1969 Principals of Demography, New York, John Wiley.
- BONGAARTS, J.
1978 "A FrameWork for Analyzing the Proximate Determinants of Fertility", Population and Development Review, Vol. 4, No. 1., pp. 105-129.

-
- 1979 "The Fertility Impact of Traditional and Changing Child Spacing Practice in Tropical Africa", in Working Paper, No. 42, New York, The Population Council.
-
- 1981 "The Impact of Fertility of Traditional and Child-spacing Practices" in Child-spacing in Tropical Africa. Traditions and Change, eds. H.J. Page and R. Lesthaeghe, New York, Academic Press. pp.111-132.
-
- 1982 "The Fertility-Inhibiting Effects of the Intermediate Fertility Variables", Studies in Family Planning, Vol. 13, No. 6/7. pp. 179-190.
- BONGAARTS, J. AND R. G. POTTER
- 1983 "Fertility, Biology and Behaviour. An Analysis of the Proximate Determinants". New York, Academic Press.
- BONGAARTS, J., O. FRANK and R. LESTHAEGHE
- 1984 "The Proximate Determinants of Fertility in Sub-saharan Africa", Population and Development Review, Vol. 10, No.3. pp 511-538.
- CALDWELL, J.C.
- 1968 Population Growth and Family Change in Africa: The New Urban Elite in Ghana. New York, Humanities Press.
- CALDWELL, J.C. and P. CALDWELL
- 1977 "The Role of Marital Sexual Abstinence in Determining Fertility: A study of Yoruba in Nigeria", Population Studies, Vol, 31, No. 2. pp. 193-217.
- CALDWELL, J.C.
- 1979 "Education as a Factor in Mortality Decline: An Examination of Nigerian Data", Population Studies, Vol. 33, No. 3. pp. 395-415.
-
- 1980 "Mass Education as a Determinant of Timing of Fertility Decline", Population and Development Review, Vol. 6, No. 2. pp. 225-255.
- CALDWELL, J.C and P. McDONALD
- 1982 "Influence of Maternal Education on Infant and Child Mortality: Levels and Causes", International Population Conference, Manila, Vol. 2. Belgium, IUSSP. pp. 79-96.
- CALDWELL, J.C., P.H. REDDY and P. CALDWELL
- 1985 "Educational Transition in Rural South India", Population and Development Review, Vol. 11, No.3. pp. 29-52.
- CHEN, L. C., S. AHMED., M. GESCHE and W. H. MOSLEY
- 1974 "A Prospective Study of Birth Interval Dynamics in Rural Bangladesh", Population Studies, Vol. 28, No. 2. pp. 277-297.

CHEN, L. C. and R. H. CHOWDHURY

- 1975 "Demographic Change and Food Production in Bangladesh, 1960-74", Population and Development Review, Vol. 1, No. 2. pp. 201-227.

CHOWDHURY, R. H.

- 1977 "Education and Fertility in Bangladesh", Bangladesh Development studies, Vol. 5, No. 1. pp.153-200.

COCHRANE, S. H.

- 1979 Fertility and Education. What do we really know ?. World Bank Staff Working Paper, No. 26. Baltimore, The John Hopkins University Press.

- 1981 "The relationship between Education and Fertility" in Women, Education and Modernization, ed. H. Ware. Canberra, Australian National University. pp. 154-172.

CONCEPCION, M. B.

- 1980 "Family Formation and Contraception in Selected Developing Countries: Policy Implications of WFS Findings" in World Fertility Survey Conference 1980, Record of Proceedings. Vol. 1. Netherlands, International Statistical Institute. pp. 197-284.

DANDKER, K.

- 1965 "Effect of Education on Fertility" in World Population Conference, Vol. IV. New York, United Nations. pp.146-149.

DAVIS, K. and J. BLAKE

- 1956 "Social Structure and Fertility: an analytical framework", Economic Development and Cultural Change. Vol. 4, No. 4. pp. 211-235.

DIXON, R.B.

- 1971 "Explaining Cross-Cultural Variations in age at marriage and Proportion Never Marrying", Population Studies, Vol. 25, No. 2 pp. 215-234.

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC (ESCAP)

- 1976 Population of Sri Lanka, Country Monograph, Series No. 4. New York, United Nations.

- 1981 Population of Bangladesh, Country Monograph, Series No. 8. New York, United Nations.

FERNANDO, D. S.

- 1976 "Fertility Trends in Sri Lanka and Future Prospects", Journal of Biosocial Science, Vol. 8, No. 1. pp. 36-44.

1977

- "Nuptiality, Education, Infant Mortality and Fertility in Sri Lanka", Journal of Biosocial Science, Vol. 11, No. . pp

FREEDMAN, R.

- 1975 "Example of Community-Level Questionnaires", Occasional Paper, No 8. London, World Fertility Survey.

- FREEDMAN, R., Tze-Hwa FAN, Sou-Peu WEI and Mary Beth WEINBERGER
 1977 "Trends in Fertility and the Effects of Education on Fertility in Taiwan, 1961-74", Studies in Family Planning, Vol. 8, No. 1. pp. 11-18.
- FREEDMAN, R. and B. BERELSON
 1977 "The Record of the Family Planning Programme", Studies in Family Planning, Vol. 7, No. 1. pp.1-40.
- GAISIE, S. K.
 1984 The Proximate Determinants of Fertility in Ghana, Scientific Reports, No. 53. London, International Statistical Institute.
- GRAFF, H. J.
 1979 "Literacy, Education and Fertility, Past and Present: A Critical Review", Population and Development Review, Vol. 5, No. 1-5., pp.105-140.
- HEER, D. M.
 1966 "Economic Development and Fertility", Demography, Vol. 3, No. 2. pp. 423-444.
- HONG, S.
 1977 Demographic Characteristics of Bangladesh. Dhaka.
- HOLSINGER, D. and J. KASARDA
 1976 "Education and Human Fertility: Sociological Prespective" in Population Development, ed. R. Ridker. Baltimore, John Hopkins university Press.
- HULL, T. and V. J. HULL
 1977 "The Relation of Economic Class and Fertility. An Analysis of some Indonesian Data", Population Studies, Vol. 31, No. 1. pp. 43-58.
- HULL, T. AND D-J ACHANFUO-YEBOAH
 1985 "Education and Literacy" in Asking Demographic Questions, Demography Teaching Notes, Series No. 5. Canberra, Australian National University, pp. 179-194.
- IMMERWARH, G.
 1977 "Socio-Economic - How much Economic. How much Social?" in The Economic and Social Supports for High Fertility, ed. L. T. Ruzicka. Canberra. Australian National University. pp. 187-202.
- JANOWITZ, B.
 1976 "An Analysis of the Impact of Education on Family Size", Demography, Vol. 2 13. pp. 189-198.
- JAIN, A. K., T. C. HSU., R. FREEDMAN and M. C. CHANG
 1970 "Demographic Aspects of Lactation and Postpartum Amenorrhea", Demography, Vol. 7, No. 2. pp. 255-271.
- JAIN, A. K. and T. H. SUN
 1972-73
 "Inter-Relationship between Socio-Demographic Factors, Lactation and Postpartum Amenorrhea", Demography India, Vol.1, No. 1. pp.78-89.

JAIN, A. K.

- 1981a Education Sector Approaches, Attainment and Fertility An Illustrative Case Study for India, International Programmes Working Papers, New York, The Population Council.

1981b "Fertility Effects of Female Education: A Simple Explanation", Demography, Vol. 18. pp. 577-596.

JAIN, A. K. and J. BONGAARTS

- 1980 "Socio-Biological factors in Exposure to Child Bearing: Breastfeeding and its Fertility Effects" in World Fertility Survey Conference: Record of Proceedings, Vol. 2. Netherland, International Stastical Institutes. pp.255-302.

1981 "Breastfeeding: Patterns and Correlates and Fertility Effects", Studies in Family Planning, Vol. 12. pp. 79-99.

KHAN, A. R.

- 1972 The Economy of Bangladesh. London, Macmillan.

KHUDA, B.

- 1982 "Fertility in Selected Asian Countries" in Journal of the Asiatic Society of Bangladesh, Vol. XXVIII, No. 2. pp. 195-203.

KNODEL, J. and N. DEBAVALYA

- 1980 "Breastfeeding in Thailand: Trends and Differentials, 1969-79", Studies in Family Planning, Vol. 11, No. 12. pp. 355-377.

LESTHAEGHE, R. J., I. H. SHAH and H. J. PAGE

- 1981 "Compensating Change in Intermediate Fertility Variables and onset of Natural fertility Transition" in International Population Conference, Manila, Vol. 1. Belgium, IUSSP. pp. 71-94.

LESTHAEGHE, R. J., P. O. OHADIKE., J. KOCHER and H. J. PAGE

- 1981 "Child-Spacing and Fertility in Sub-Saharan Africa: an Overview of Issues" in Child-Spacing in Tropical Africa, eds. H. J. Page and R. Lesthaeghe. New York. Academic Press. PP. 3-24.

LEIBENSTEIN, H.

- 1977 "The Economic Theory of Fertility Decline", Quarterly Journal of Economics. Vol. 91. pp. 457-479.

LINDENBUM, S.

- 1984 "The Influence of Maternal Education on Infant and Child Mortality in Bangladesh", Paper presented to the IUSSP Seminer. Canberra.

LUCAS, D.

- 1977 "Urban and Rural Fertility in Southern Nigeria" in The Economic and Social Supports for High Fertility. ed. L. T. Ruzicka. Canberra, Australian National University. pp. 409-422.

-
- 1980 "Fertility", Begining Population Studies. eds. D. Lucas et al, Demography Teaching Notes, Series No. 2. Canberra, Australian National University. pp. 63-92.
- MALONY, C., K. M. A. AZIZ and P. C. SARKAR
- 1981 Beliefs and Fertility in Bangladesh, Monograph. No. 2. Dhaka, International Centre for Diarrhoel Disease Research.
- MAULDIN, P. W.
- 1981 "The Determinants of fertility Decline in LDCs: An Overview of the Availabile Empirical Evidence" in International Population Conference, Manila. Vol. 2. pp. 5-24.
- MCNICOLL, G.
- 1980 "Institutional Determinants of Fertility Change", Center for Policy Studies, Paper No. 59. New York, The Population Council.
- MURTY, R.K. and N. U. RAO
- 1983 "Female Education, Modernity and Fertility: A Study in the Indian context", Demography in India, Vol. 12, No. 1. pp.88-95.
- MUSHAM, H. V.
- 1969 "Education and Demography", International Population Conference, London, Vol. III. pp. 1867-1875.
- MUTHIAH, A. and G. V. JONES
- 1983 "Fertility Trends among Overseas Indian Populations", Population Studies, vol. 37. pp. 273-299.
- NAG, M.
- 1975 "Socio-Cultural Patterns, Family Cycle and Fertility" in The Population Debate: Dimensions and Prospectives. Papers of the World Population Conference, Bucharest, 1974, Vol. 2. New York, United Nations. pp. 289-312.
-
- 1979 "How Modernization can also Increase Fertility " in Center for Policy Studies, Working Papers, No. 49. New York, The Population Council.
-
- 1981 "Impact of Social Development and Economic Development on Mortality: A Comparative Study of Kerala and West Bengal", Center for Policy Studies, Working papers, No. 78. New York. The Population Council.
-
- 1982 "Modernization and its Impact on Fertility: The Indian Scene", Center For Policy Studies, Working Papers, No. 84. New York, The Population Council.
-
- 1983a "The Equity, Fertility Hypothesis as an Explanation of Fertility differential between Kerala and West Bengal", Centre for Policy Studies, Working Papers, No. 96. New York, The Population Council.

-
- 1983b "The Impact of Socio-Cultural Factors on Breastfeeding and Sexual Behaviour" in Determinants of fertility in Developing Countries, Panel on Fertility Determinants, eds. R. A. Bulatao et al. New York, Academic Press. pp. 163-198.
- ONI, G. A.
- 1985 "Effects of Women's Education on Postpartum Practices and Fertility in Urban Nigeria", Studies in Family Planning, Vol. 16, No. 6. pp.321-331.
- PAGE, H. J., R. J. Lesthaeghe and I. H. SHAH
- 1982 Illustrative Analysis: Breastfeeding in Pakistan. Scientific Reports, No. 37. Netherland, International Statistical institutes.
- PLANNING COMMISSION OF BANGLADESH
- 1973-78
- The First Five Year Plan. Government of the Peoples' Republic of Bangladesh, Dhaka.
-
- 1980 The Second Five Year Plan. Government of the Peoples' Republic of Bangladesh, Dhaka.
- RABBANI, A. K. M. G., S. D'SOUZA and S. RAHMAN
- 1979 "1974 Census Estimates of Fertility levels in Bangladesh" in Fertility in Bangladesh: Which way is it going ?. eds. M. Hossain et al. Dhaka, Bangladesh Fertility Survey. NIPORT. pp. 10-40.
- RASHID, H.
- 1981 An Economic Geography of Bangladesh. Dhaka, University Press.
- RHODESH, L
- 1971 "Socio-Economic Correlates of Fertility in the Metropolis: Relationship of Individual and Areal Unit Characteristics", Social Biology, Vol. 18, No. 3. pp. 296-304.
- RODRIGUEZ, G. and J. CLELAND
- 1980 "Socio-Economic Determinants of Marital Fertility in Twenty Countries: A Multivariate Analysis" in World Fertility Survey Conference, Record of Proceedings, London, 1980. Vol. 2. Netherland, International Statistical Institute. pp. 337-434.
- SANTOW, G. and M. BRACHER
- 1981 "Patterns of Postpartum Sexual Abstinence and their implications for Fertility in Ibadan, Nigeria" in Child-Spacing in Tropical Africa: traditions and change, eds. H.J. Page and R. Lesthaeghe. New York, Academic Press.
- SATHAR, Z. and V. C. CHIDAMBARAM
- 1984 Differentials in Contraceptive Use, Comparative Studies, Cross-National Summaries, No. 36. London, World Fertility Survey.
- SHAHIDULLAH, M.
- 1979 "Differential Nuptiality Patterns in Bangladesh". Unpublished M.A Thesis, Canberra, Australian National University.

SIMON, J. L.

- 1974 The Effects of Income on Fertility, Monograph 19, Chapel Hill, North Carolina: Population Centre, University of North Carolina.

STYCOS, J. M.

- 1965 "Education and Fertility in Puerto Rico", Proceedings of the World Population Conference, Vol. IV. pp. 177-180.

UNITED NATIONS

- 1973 The Determinants and Consequences of Population Trends, Vol. 1. New York, United Nations. pp. 66-106.

- 1983 A Comparative Analysis of World Fertility Survey Data for Twenty Two Developing Countries. New York, United Nations.

WILSON, P.

- 1975 Economic Implications of Population Growth. Sri Lanka Labour Force: 1946-81. Canberra, Australian National University.

WORLD FERTILITY SURVEY (WFS)

- 1978 Bangladesh Fertility Survey, First Reports. 1975. Ministry of Health, Population Control. Population Control and Family Planning Division. Dhaka, Government of the Peoples' Republic of Bangladesh.

ZARATE, C.

- 1967 "Fertility in the Urban Areas of Mexico: Implications for the Theory of Demographic Transition", Demography, Vol. 4, No. 1., pp.363-373.

APPENDIX A

THE KEY QUESTIONS USED IN THIS STUDY

This thesis is based on three subsets of data obtained from the Bangladesh Fertility Survey and Household Survey, conducted during 1975-76. The key questions which were used for measuring the indices of Bongaarts model and other important variable regarding subgroups and areas are mentioned here.

109 Have you ever attended school?

Yes

!

☐

No

(SKIP TO 113)

☐

110 What was the highest level of school you attended

CLASS

PRIMARY

☐ 1

MADRASHA

☐ 4

HIGH SCHOOL

☐ 2

COLLEGE

☐ 5

UNIVERSITY

☐ 3

OTHER

SPECIFY

111. What was the highest class you passed at that level?

(CLASS)

201. Now I have some questions about your married life. Are you now married, widowed, divorced or separated?

MARRIED

☐ 1

WIDOWED

☐ 2

DIVORCED

☐ 3

SEPARATED

☐ 4

328. How many months after (the birth of this child, end of your last pregnancy) did you first start having sexual relations?

-----MONTHS

NOT YET
STARTED

☐

329. How many months after the birth of this child (termination of pregnancy) did your period come back?

-----MONTHS

PERIOD NOT
BACK YET

☐

505. Are you or your husband using currently using a method to keep you from getting pregnant?

YES

☐

NO

☐

!

507a. What method are you using?

507b. How long have you been using this method continuously?
