ผลกระทบของสถานะของเพศหญิงต่อภาวะเจริญพันธุ์ประชากรในราชอาณาจักรภูฐาน

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
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IMPACT OF WOMEN'S STATUS ON FERTILITY IN THE KINGDOM OF BHUTAN

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts Program in Demography
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ภูมิหลัง : สถานะของเพศหญิงมีบทบาทสำคัญมากในประเทศที่มีการเปลี่ยนผ่านทางประชากรเช่นภูฏาน และส่งผลกระทบต่อพฤติกรรมการเจริญพันธุ์ของเพศหญิง ซึ่งการศึกษาครั้งนี้ มุ่งพิจารณาถึงผลกระทบทางสถานภาพสมรสของเพศหญิงในภูฏาน และพยายามที่จะศึกษาว่าพฤติกรรมการเจริญพันธุ์ของเพศหญิงในภูฏาน มีผลต่อสถานะของเพศหญิงในสังคม

ระเบียบวิธีวิจัย : ข้อมูลที่ใช้ในการศึกษาครั้งนี้เป็นข้อมูลทุติยภูมิจากการสำรวจดัชนีชี้วัดของประเทศภูฏาน (Bhutan Multiple Indicator Survey) ที่ดำเนินการโดยสำนักงานสถิติแห่งชาติภูฏาน (National Statistical Bureau) ในปี 2010 โดยมีตัวอย่างทั้งหมด จำนวน 16,823 คน โดยวิเคราะห์เพศหญิงที่เคยแต่งงานแล้ว จำนวน 14,018 คน ที่อยู่ในช่วงวัยเจริญพันธุ์ (อายุ 15 - 49 ปี) โดยใช้การวิเคราะห์แบบตัวแปรสองตัวแปรและหลายตัวแปร เพื่ออธิบายถึงความสัมพันธ์อย่างมีนัยสำคัญทางสถิติของตัวแปรที่สนใจ

ผลการศึกษาพบว่า ค่าเฉลี่ยของบุตรเกิดรอด (CEB) ในกลุ่มเพศหญิงชาวภูฏานที่แต่งงานในช่วงวัยเจริญพันธุ์ คือ 2.58 คน ผลการวิจัยได้ค่าไคสแควร์เท่ากับ 7.0803 ที่ระดับนัยสำคัญที่ 0.000

สรุปผลการศึกษา พบว่ามีความสัมพันธ์อย่างมีนัยสำคัญระหว่างพฤติกรรมทางภาวะเจริญพันธุ์ของประชากรและสถานะของเพศหญิงในภูฏาน ดังนั้นจึงสามารถสรุปได้ว่านโยบายที่เกี่ยวข้องกับภาวะเจริญพันธุ์ควรที่จะวิเคราะห์และเน้นสถานะของเพศหญิง จากตัวแปรต่าง ๆ ที่ได้นำเสนอเพื่อนำไปสู่อัตราการเพิ่มประชากรที่สมดุล

สาขาวิชา ประชากรศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2556 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

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KIBU ZANGPO: IMPACT OF WOMEN'S STATUS ON FERTILITY IN THE KINGDOM OF BHUTAN. ADVISOR: ASSOC. PROF. PUNGPOND RUKUMNUAYKIT, Ph.D., 105 pp.

Background: Women's status plays a very important role in the country of demographic transitions like Bhutan and to a large extent affect their fertility behaviors. In view of these considerations, the present study seeks to identify the possible impact of women's status on marital fertility behavior in Bhutan and endeavors to find out whether the fertility behavior of women in Bhutan has been determined by their status.

Methods: The data used in this study is the secondary data from Bhutan Multiple Indicator Survey carried out by the National Statistical Bureau in 2010. The total sample identified was 16,823. Of these, the analysis was confirmed to ever-married women of 14,018 in reproductive aged (15-49) years. Both bivariate and multivariate analyses have been executed to explain the significant associations in the study.

Results: The study revealed that the mean value of CEB among married Bhutanese women of reproductive age was 2.58 children. The findings also revealed that the probability of the model chi-square (7.0803) was 0.000, less than the level of significance at 0.05. Suggesting an existence of statistically significant associations between the explanatory variables and dependent variable.

Conclusion: It can be concluded that program implementers should aim to augment and improve the women's status by focusing on these identified factors. It is therefore important that future efforts to manage and bring in a balance growth in population should, focus on the various dynamics that strongly determine the status of women and its empowerment in the country.

Field of Study: Demography Student's Signature .....

Academic Year: 2013 Advisor's Signature .....

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GLOSSARY OF ACRONYMS

ASAIHL	Association of Southeast Asian Institutions of Higher Learning
BMIS	Bhutan Multiple Indicators Survey
BPHC	Bhutan Population and Housing Census
CEB	Children Ever Born
CPS	College of Population Studies
MDG	Millennium Development Goals
NCWC	National Commission for Women and Children
NSB	National Statistical Bureau
SPSS	Statistical Package for Social Sciences
TFR	Total Fertility Rate
TICA	Thailand International Cooperation Agency

GLOSSARY OF BHUTANESE TERMS

Dzongkhag	District
Dasho	The best one

(It is reserved for outstanding individual who normally hold high posts)

Chapter I

INTRODUCTION

1.1 Background

Bhutan is generally an agriculture-based country, with majority of its people depending on agricultural products for income. In such a society, the relative income and the level of education would probably be low, but the financial return of having more children is high. Weeks (1992) explained that in high fertility societies children can be viewed as a principal economic resource. Young children help in many different tasks and provide labour force support as they mature. This is more predominant in the pre-modern society where agriculture is a primary source of income.

In general, women who lives in such a society are not accorded equal status with men and have very limited opportunities compared with men in most economic, political and social activities. The greater part of women and girls in the world are residing in countries where their status is poor to exceptionally poor and that menace their health. In many ways, their health has been compromises by their poor status. The early marriage and child bearing has become the norms in many cultures and traditions. Early child bearing and high parity increase the women's chance of complication in child bearing. Pregnancies are most dangerous for women who are too young (less than 18) years, have too many births (4 or more children) and do not want another pregnancy may resort to unsafe abortion (John Hopkins University, 1988). The disproportionate in status of women and their lack of opportunities are often taken for granted and are considered normal. The gender disparity intensely embedded in families, communities, and individual minds, remain significantly invisible and undervalued.

However, there is close relationship between various aspects of women's status or position of women either in the family or in the society and demographic patterns of fertility, morality and migration. Fertility, from among the three population processes, is the most studied as it can have many political, social and economic effects on any country. Fertility is one of the elements in population dynamics that has a significant contribution towards changing population size and structure over time (Yohannes *et al*., 2004). Estimations of past and present fertility rates help determine the demand for social services and medical care, political views and voting patterns. Unfortunately, fertility is the most difficult demographic variable

to predict and explain (Hinde, 1998; Brown & Norville, 2001). However, fertility may be defined as the actual reproductive performance of a woman i.e. the number of children born per couple, person or population.

In the 1950, fertility rate in Asia was close to 6, well above the world average but by the end of the century, it had fallen well below 3, less than half the earlier level. Many countries in Asia now have below replacement low fertility.

Although Bhutan has seen substantial improvements in its level of educational attainment, reproductive health outcomes, such as in the reduction of maternal and infant mortality, the increase in the contraceptive prevalence rate, and health service utilization among married women, the total fertility outcome of the number of children born is still high compared to that of other developing countries. For instance, the TFR estimated earlier from the National Health Survey of 1994 found to be 5.6 per woman. The underlying cause of high fertility in Bhutan needs further investigation and exploration in order to be better understood and appropriately addressed by reproductive health programs.

It is therefore, essential to identify the risk factors associated with high fertility and to provide services to address those who are at risk. To develop effective strategies for fertility control, it is necessary to understand the factors affecting fertility. It is hypothesized that women in vulnerable groups, such as those who got married at young age, are uneducated, are living in rural areas, are very poor, and have limited knowledge and very less awareness on contraceptive methods, results to have high number of children born. The World Population Plan of Action also stated that one important way to moderate fertility was through the full integration of women in the development process, particularly by means for their greater participation in educational, social, economic and political activities (United Nations, 1975).

About 50 percent of the total population consists of women in Bhutan, where majority are dwelling in rural areas. It is evident from the Bhutan Multiple Indicator Survey (BMIS) 2010 that, of the total women respondent aged 15-49 years, 68.3 percent lived in a rural areas and 31.7 percent in an urban areas. Slightly more than 70 percent of women aged 15-49 had given birth at least once in their lifetime. In course of time, urban female become conscious about the risks of having high number of children born, whereas, rural women are not much aware of the same issues because of very low status. There are huge-gap problem between the high and low status of women in the country. In the case of education, 63.5 percent of

women aged 15-49 had never been to school, while 12.2 percent had primary schooling. Another 24.3 percent had completed their lower or middle secondary and higher or college education. Therefore, women are not consciousness towards their number of children, and moreover the health condition of mother is very poor.

However, with development in terms of education, health care, wealth status, in 2005 the TFR has been estimated to be 2.6 per woman based on births in the past one year as per (Office of the Census Commissioner, 2005.), Population and Housing Census of Bhutan (PHCB). This shows a gradual decline in fertility in Bhutan indicating the rapid development taking place in the country since the initiation of the first five year plan in 1961. However, very limited fertility studies have been carried out both at the national and the individual level, particularly on the factors determining the fertility behavior in relations to women's status.

1.2 Problem Statement

In recognizing its importance, most studies in developing countries have put emphasis on the role of demographic, socio-economic, and cultural factors in determining difference in fertility and also the impact of this factor on fertility. The specific nature of the determinants of fertility is intricate and complex. While, fertility behavior influences population growth, which has consequences on resources, employment situation, economic status, health and other social facilities and saving and investment, in turn, such consequence have greater bearing on socio-economic variables that affect fertility behavior. Socio-economic factors are in turn affected by demographic factors. These factors directly and indirectly affect the interaction process. Socio-economic variables may not directly influence fertility but they may influence indirectly (Samson and Mulugeta 2009).

The mechanism of factors affecting fertility is that intermediate variables influence fertility directly, while socio-economic variables affect fertility indirectly through intermediate variables (Bongaarts 1978). As high fertility is associated with increased obstetric and medical risks of mother, in order to reduce fertility and control population growth of the country, the factors that influence fertility should be clearly identified (Zhang, 2007). Human fertility is a function of a variety of factors. Some of these factors could be education, occupation, wealth status, place of residence, contraceptive, region, age at first marriage and child loss. A proper understanding of these factors are of paramount importance in tackling the problem of uncontrolled fertility, which paves the way for the improvement of the prevailing

socio-economic problems of the country. Particularly, it would have a substantial contribution in the improvement of the health status of women and children.

It has been reported that fertility transition has begun in many developing countries since 1960s (Bongaarts 2008). In Bhutan, even though the women's status has improved remarkably essentially regarding education, there are problems to be faced. Large numbers of women remain illiterate or have limited education and skills, and there are a lot of women who got married at younger ages, especially in the rural areas. The fertility level of Bhutan especially in the rural area is unacceptably high. The higher the fertility of women, the more the risk associated with each birth. The reproductive role on top of the productive role of women put her in a poor social and economic status. In addition, most of them work in the agricultural sector and have very low family income. These are only a few of many constraints preventing greater involvement of women in labour force participation, either in the family or in the society.

Furthermore, men on average, hold all the power and status in society, while women are ascribed the roles of wife, housekeeper and child bearer. But depending on their status, women may also have an important role in making decisions related to fertility behavior. Decisions for having: small family size, additional number of children, birth spacing, having another pregnancy, stopping childbearing, or using contraceptive methods may depend not only on husband but also on wife. When the wife has resources like high education, income, occupation etc. her views may carry greater weight in these decisions. Thus women's role and status in the family and society greatly affects the degree of control she has over her own fertility.

The prospective to make a decision when and whether to conceive children is a fundamental element in being able to decide the kind of life a woman wants to escort. Ascend in the educational intensity of women, their work outside the home and development of additional and proverbial activities would lead women to choose a limited number of children. At the same time create the possibility for women to have a greater say in number and timing of having children.

Especially in societies like Bhutan that experience a transformation from traditional to modern, changing status of women in society and in the family usually results in increase in the undesirability of pregnancy. These are some of the factors which determine the statuses of women to a larger extend and which in turn affect their fertility behavior. Also in Bhutan, the status of women plays a very important role in demographic transition of the country. The country as a whole went through

social and economic transformations, in which, the women's status in the country has changed as well, notably affecting the demographic behavior of its fertility.

On the other hand, despite continues flourishing in the modernization progress, the social life of the society in Bhutan is essentially characterized by patriarchy which finds its manifestation in the position of women. Therefore, women in Bhutan live in an exceedingly varied and mixed social structure where the co-existence of modern and traditional attitudes and behavior is the prevalent pattern in the social and cultural life of the country. In view of these considerations, the present study seeks to ascertain the potential and promising impact of women's status on marital fertility behavior in Bhutan and tries to find out whether the fertility behavior of women in Bhutan has been adapted by their position.

1.3 Justification of the Problem

The factors responsible for the determinants of fertility level would help in designing strategies to effectively implement any program to tackle uncontrolled fertility and in raising the status of women. The effect of women's status on fertility behavior may be seen clearly through the education of women, work status or types of occupation, residence and wealth status.

In general, women who reside in urban area tend to prefer lower fertility. In Bhutan, majority of women reside in rural areas and therefore access to material and social resources such as education, income, occupation, etc. is still constrained. Furthermore, women who have high education tend to prefer less fertility outcome. Whereas, in Bhutan, many women were illiterates and got married in the young ages, that may bear on their fertility outcome especially in rural areas. On the other hand, women who have employment status and labor force participation tend to prefer smaller fertility outcome. But, many women have very low income and Bhutan is basically an agricultural-based country, where women are mostly involved in sustenance farming, which may have bearing on their fertility outcome.

This means that women's preference for having smaller fertility outcome is still to be achieved. Women's status seems necessary to understand and examine how the fertility tendency among Bhutanese women can be reduced in future. Further, this study will help to planners, implementers and change agents of their field. In addition, it will be useful to know that women's status is meaningful for controlling the number of children born. This research will help to answer the following questions:

1. Is women's status associated with fertility and fertility-related behavior?
2. What are the socio-economic characteristics of women identified in this study?
3. What is the impact of women's status on number of children born?
4. What will be the recommended strategy related to fertility behavior of women?

Therefore, studying the status of women and fertility outcomes among ever married women in Bhutan is likely to have important program implications.

1.4 Objectives

Since fertility is an important component of population dynamics which plays a major role in the size and structure of a given population and as uncontrolled fertility has adversely influenced the social economic, demographic and environmental development of the country, this study will explore the effects of status of women on fertility outcomes in Bhutan. Specifically, this study aims to identify status of women indicators that influenced fertility behavior among ever married women in reproductive age in the country. The 2010 Bhutan Multiple Indicator Survey (BMIS) endow with an available opportunity for a more comprehensive analysis of fertility, which this study responds with specific objectives set hereunder:

1. To determine the impact of women's status on fertility in Bhutan.
2. To find the relationship between some selected socio-demographic variables and CEB.
3. To provide the research based evidence to policy makers for appropriate programmatic action in order to improve the status of women.
4. The study will examine the degree of impact by women's level of education and schooling on fertility, since education is the only variable which exhibits a strong negative relationship with fertility.
5. To study and evaluate the affect of fertility in Bhutan by place of residence.
6. The study will further examine on how does wealth status influence fertility in the country?
7. To contribute for the limited fertility studies done in the country and could be useful as a stepping stone for further studies.
8. To investigate the trends and also assess to what extent will the use of contraception methods induce fertility decline in Bhutan.

1.5 Organization of the Study

The study is composed of five chapters. The first chapter deals with the general background of the study and constitutes the introduction, problem statement and justification, objectives and limitation of the study. Chapter two provides a review of the existing literature related to the current study. In chapter three, the research methodology was described used in this study, followed by chapter four devoted to discussion of the findings of this study. Finally summary and conclusion of the study, and policy recommendations based on the findings are presented in chapter five.

1.6 Implications for Future Research

This study does not cover such important variables like occupation, labour force participation, employment status and participation in politics, etc because these variables would also have added more intended to measure women's status. It was indicated from the various literature reviews that, the above stated variables mediate the link between women's status and CEB.

In this study, only effectiveness of use of contraceptives was measured, while other intermediate fertility variables could not be covered. Hence, a further study may be conducted with more appropriate other intermediate variables in order to obtain a more realistic analysis.

Although, the findings of this study are valid and more realistic because the secondary data used in this study are from the Bhutan Multiple Indicators Survey (BMIS) carried out for the nation-wide by National Statistical Bureau (NSB) in 2010. However, the results may not necessarily imitate the most recent situation of Bhutan for the reason that, considerable changes might have already taken place beyond our comprehension of 2010 BMIS's data, since Bhutan is very speedy in its socio-economic development and also in terms of educational attainment.

The comparative studies can be carried out between the quality of children and women's status so that the problem of those women who experiences the child loss can be solved to the greater extent. Further, the conduct of any future studies on fertility behaviors in the country are advisable to maintain and record at what age the woman has given a birth to each and every child up to the survey date.

Chapter II

LITERATURE REVIEW

In this chapter, the paper reviews research literature elucidating the impact of women's status on fertility behaviors in Bhutan. Literature review about women's status on fertility is scanty in Bhutan. It has been learnt that nobody even made a detailed attempt for study about the affects of women's status on fertility among the ever married women in the country. Nevertheless, many studies around the world have been recognized women's status as one of the most important socio-economic and cultural factors affecting the fertility transition. In past decades, many studies have been carried out to investigate the relationship between women's status and their fertility behavior (Mason. K.O and Palan V.T. (1981.) The results of these studies have contributed to my understanding of fertility transition, especially in developing countries such as Bhutan. Hence, this section reviews available literature and studies on fertility and general information on fertility will be presented followed by factors that affect fertility, mainly focusing among the educational attainment, wealth status and the urban/rural residence of women. Furthermore, the various causal factors affecting fertility have been reviewed from various literatures and discussed hereunder.

2.1 General Overview

The term of fertility in demography relates to the actual number of live birth of women experience. Generally, in a study it interprets as number of children ever born of married women at reproductive age from (15-49) years old (Bongaarts, 1982). The demographic pattern of developing countries is characterized by the co-existence of high fertility and high infant, and child mortality (Yohannes et al., 200). Fertility is one of the three major components of population dynamics that determine the structure and changing population size of the country. Differential in fertility behavior and fertility levels in different areas and among population strata or characteristics have been among the most pervasive finding in demography (Ramesh Adhikari., 2010).

Many studies on fertility and behavior, and related factors have been conducted by Hawthorn (1970), (Freedman, 1995) and Fawcett (1970). Recent studies about fertility attitudes and behavior not only focus on socio-economic, demographic and psychological factors as influencing factors, but also include women's status, cultural factors, political commitment, etc.

2.2 Determinants of Fertility

Earlier studies on fertility present different explanations of its pattern and trends among various societies in the world. This led to the formation of opposing schools of thought in viewing the relationship between certain factors and fertility. Some groups discovered that certain factors can have a direct effect on fertility while others can claim that these factors are not a precondition for fertility decline. Many theories have been proposed to help explain the factors and conditions that influence fertility. One such theory was the classical demographic transition theory posited by Notestein (1953) which stated that when industrialization and urbanization take a strong hold in the society, fertility would decline and would enter a stage called the –inception decline. Industrialization and urbanization are indirectly or directly linked to the socio-economic conditions of a society; better socio-economic conditions are likely associated with lower fertility. Notestein (1953) also argues that fertility is high in agricultural societies like Bhutan to offset high mortality, thus ensuring population survival.

Demographers and social scientist did several studies to validate the classical demographic theory in Europe and in some developing countries. Some studies suggest a tighter association between socio-economic change and fertility decline like the analysis of fertility differentials in selected countries from Africa, Central America and Caribbean, South America and Asia from the period 1968-1970 and concluded that adult literacy rates, levels of children's education, and female labour force participation rates were negatively related to fertility, and percentage of the labour force in agriculture was positively related to fertility.

According to Bongaarts (1978), factors affecting fertility are broadly classified into proximate (direct) and distal (indirect) factors. The proximal factors are bio-behavioral factors, like being sexually active, use of contraceptive, duration of postpartum infecundability, abortion and sterilizing which affect fertility directly, whereas, distal determinant are socio-cultural factors which affect fertility indirectly through affecting the bio-behavioral factors. It is also found that a later age at marriage reduces fertility. Educational level, economic status, place of residence, women's work participation etc. are other factors affecting fertility in addition to contraception control and attitudes (Samson and Mulugeta 2009). On the other hand, some studies concluded that fertility transitions which started at widely differing levels of development and socio-economic factors were only weakly predictive of fertility decline (Watkins, 1996; Cleland & Wilson, 1987; Bongaarts, 2005).

This finding is also consistent with a study in Bangladesh which demonstrated that even if socio-economic development is desirable and it would enhance the status of women, it does not seem to be a pre-condition for fertility decline (Islam & Islam, 1990). The next section will be a discussion of some socio-economic variables, geographic location, urban/rural residence, education and employment – and their relationship with fertility, whether directly, indirectly or none at all.

2.3 Geographic Location

Studies of historical fertility declines such as in Europe by (Coale, 1986; Watkins, 1986) have established the significance of geographical location as a factor that can influence fertility differentials as well as of the process of fertility change. It appears that differences in fertility across certain geographic locations (e.g. 3 regions and 20 Dzongkhags in case of Bhutan) can be explained by socio-economic structures as in the case of Malaysia (Peng, 2002) and knowledge and use of family planning methods as in the case of Kenya (Central Bureau of Statistics (CBC) [Kenya], Ministry of Health (MOH) [Kenya] and ORC Macro, 2004) all associated with development. High fertility was found in the underdevelopment outlying regions in Japan while low fertility prevailed in the developed regions in central Japan (Ogasawara, 1974).

Cultural explanation are also needed to explain geographical similarities in demographic behavior, wherein cultural can be defined in several ways to include factors such as region, religion and language. The association between geographic location and fertility performance is also evident in the variances in fertility among the different political regions in the Philippines which can be due to a large extent to diverse set factors such as population politics/programs, religious and cultural norms in the regions (Cruz, 2008).

2.4 Definition and Measurement of Women's Status

Women's status explanation of fertility had been receiving much attention worldwide during the last century and before. In this context countless studies and inquiries have been investigated on the relationship between fertility and women's status. Historically, improvements in the socio-economic status of women as implied in the process of economic development and modernization of society has been measured in terms of aggregate indicator like female literacy and schooling rates, female labour force participation rates, female life expectancies, and so on.

One of the most commonly used indicators of women's status, and one which continues to receive a lot of attention by the governments, has been the

percentage of school educated women. Improving the level of female education is also justified on the grounds of the instrumental significance of female education for influencing women's contribution to the development process through their 'reproduction'.

While these macro indicators do reflect the position of women relative to men the society or relative to women in other society or classes, they are inadequate in capturing women's ability to function and control at the individual level, i.e. ability to be healthy and well nourished, to have healthy well-nourished children, to be able to access public services and mobilize community resources, to be able to move freely in public, to be able to gain information and knowledge, to be able to participate in the community, etc. For example, little is known about how formal schooling influences women's personal attitudes about their own well-being and self-efficacy. The impact of female employment on behavior is even less consistent, suggesting that the underlying institutional structures which determine the value of women's labour in the society may play an important role.

A more realistic understanding of the concept of women's status should be rooted in the broader socio-economic environment and the prevailing ideologies regarding socially legitimate gender behavior. The concept of status must also be distinguished from the concept of autonomy which refers to the gender balance of power and how this affects women's control over their productive and their reproductive behavior. Even though women may rise to higher status levels (such as with the birth of the first son or on becoming a mother-in-law) within the existing social hierarchy, their subordination to men is not necessarily reduced. Alternately, although women may gain some degree of autonomy through various non-family experiences (such as wage employment for survival) they may lose some of their status by having broken the tradition of seclusion. Hence, the underlying trade-off between status and autonomy become crucial in trying to identify and evaluate the pathways of impact on women's lives.

In the social and demographic literature the status of women has studied in the context of female autonomy (Dyson and Moore, 1983), and women's rights (Caldwell, 1981). All of these terms refer to some aspect of gender inequality. For example, implicit in most definitions of status of women is a comparison with the status of men. Patriarchy refers to the extent to which men control women. Women are powerless and dependent on men. Women's right, are also related to or compared with men.

On the other hand, Safilios – Rothschild (1980) revealed that sex stratification system determines that men only will occupy major decision-making position and control the value of resources such as wealth, income, credit, knowledge, valued skills for the generation of more resources like food, health, power and prestige within the family, in their community and the society at large. The definition of women's status also depends on location in the society. In one place, women may be powerless of or have low status, but it does not mean that women are powerless or have low status in the other areas within the same society (Whytes, 1978 cited from (Mason, 1984).

Hence, it is important to talk about the status of women by specifying the geographical or administrative social units in which that status is being discussed. For example, in Asian cultures including Bhutan, the position of new bride tends to be quite different from the position of her mother-in-law. The new bride is usually powerless, while the mother-in-law often has considerable domestic authority.

Furthermore, the United Nation (1984) defines the status of women as the unification of the position a woman occupies as a worker, a student, a wife and a mother; the power and prestige attached to these positions; and the rights and duties she is expected to exercise.

2.5 Age of Women

In general, age was identified as one of the most important variables in determining fertility patterns in society since fertility is related to the life-cycle of each parent and of the family unit. A women's age is a significant factor involved with the probability for her to get pregnant. Increasing in fertility with age is a well-documented and very apparent problem in modern society. The longer women to have children, the higher the chance are for them to have fertility problem due to the quality of the eggs and other related issues (Vilaysook, 2009).

A research conducted in Thailand revealed that the ideal number of children has been quite stable for younger married women but has declined more or less steadily for married women aged 25 and above. Study in other Asian countries also revealed that desired family size increases as age of women increases (Cho, 1978). The same findings were also found in the Philippines which showed that younger women prefer fewer children in general (Nazared and Chavez et. al., 1974). A study in West Java, Indonesia concluded that younger couples had smaller family size preferences compared to older couples (Herartri, 2004). A study in Nigeria conducted

by Farooq found that age had a significant effect on fertility change (Farooq, 1985: 322-343). Based on the studies, the age of women is expected to have positive relationship on fertility transition in Bhutan.

2.6 Age at First Marriage

Marriage is one of the proximate determinants of fertility (Bongaarts 1978). Given the fact that fertility takes place within marriage, there is an inverse relationship between age at first marriage and fertility. The age at first marriage has a major effect on child-bearing because women who marry determinants the length of exposure to the risk of becoming pregnant and a greater number of the commencement of the process of child-bearing timings (CSA, spec 2006 and Islam 2009).

In a study on differentials of fertility in Awassa, the age at first marriage was significantly associated with the level of fertility, the age at first sexual intercourse and the age at first birth (Samson and Mulugeta, 2009). Marriage is a leading social and demographic indicator of the exposure of women to the risk of pregnancy, especially in the case of low levels of contraceptive use, and, therefore, is important for an understanding of fertility. Women who marry early, for example at age fifteen, have roughly twice as many years of productivity as those marrying at age 30.

In developing countries, age at first marriage is considered as an important determinant of fertility reduction. Generally, women who marry young will have had a longer duration of marriage and have borne more children, this means that fertility change not only depend on the extent to which births are controlled within marriage, but through postponement of age entry into marriage. As a result of early marriage, the high fertility was observed in Peru (Bongaarts 2005). Early marriage increases the number of reproductive years in marriage with the concomitant exposure to risk of conception (Osuafor 2011). On the other hand, it was reported to have contributed to the fertility decline in Tunisia and Algeria with the increase of age at first marriage (Fargues 1988).

Socio-economic development, particularly improvement in women's education, wealth status, provision of increased employment opportunities for women and raising their status has a close relationship with age at first marriage because it can contribute to higher age at marriage. Women who had higher education are more likely to postpone their marriage. Education also exposes women to ideas and information which lead to small value. Thus, women who marry

at later ages may have fewer children not only because they have less time available for child-bearing, but also because their attitude and their expectations are different. Women who seek higher education will probably delay marriage and child (ESCAP, 1987). Thus, women who marry late tend to be better educated, have a higher social status and practice contraception to a great extent than women marrying younger (Abdul Hakim 1994). A study conducted by Rohani (2004) in East and North Java, identified the strong negative relationship between the CEB and age at first marriage.

2.7 Education of Women

In terms of education, women with high educational attainment have lower fertility than low educational women. Women who have high education are more likely to postpone their age at first marriage and child-bearing beyond the average age of marriage as long as they stay at the school (Karim, 1986). This means that female education also effects the duration of marriage and opportunities for having children. Education was also considered to be associated with an increase in women's domestic power in the household (Mason, 1984). Women who have domestic power are more likely to participate in decision making in their family and then to have smaller desired family size. In addition, education tends to break down barriers to communication about family planning between spouses (Derebsa Dufera Serbessa., 2002). Similarly, it has important implications in raising family planning discussion like the use of contraception, which ultimately reduces the fertility level and helps to reach the replacement level of fertility with their husband. Women's education, directly or indirectly influences contraceptive use (Azhar Saleem and G.R. Pasha. , 2008). In the studies conducted by Samson and Mulugeta (2009), low educational status of women was mainly found to be associated with high fertility. It was concluded that mothers with educational status of primary school or mothers with no education had risk of having 5 or more children ever born. In a similar manner, the husband's desire for more children, a preference for the sex of the next child, and the women's poor educational attainment remain the main barriers to contraceptive use in Pakistan (Azhar Saleem and G.R. Pasha. , 2008). Educated women are more likely to have smaller families and use contraception more than the uneducated women.

The spread of education and literacy among women is also believed to be fundamental to changes in reproductive behavior. It is widely studied that fertility is most responsive to improvements in human development particularly in female

education and child survival (Bongaarts, 2005; Sen, 1999; (Jejeebhoy, 1995). This relationship is strongly supported by the fact that replacement fertility has been achieved in some very poor societies like the state of Kerala in India and Sri Lanka because of their high levels of literacy, female empowerment and low infant/child mortality (Bongaarts, 2005).

Also, the improvement of female education has been claimed to have a substantial effect on the commencement of the onset of fertility transition even in the absence of a strongly organized national family planning program as in the case of Sri Lanka during the decade of the 1960s. The advancement of women's education and subsequent wage employment increased their status within the family and within the society having a significant impact on the decline of fertility (Dissanyake, 1996). Education has an increasing negative impact with the timing of the first birth.

In terms of fertility outcome, education is an important factor which can influence the desired family size of women. Generally, women with higher education may also have (1) been exposed to an urban, modernizing environment, (2) new vision and normative orientation (3) aspirations for a higher level of living and (4) greater interest in events occurring outside of the home (Jordan, 1976). In order to achieve these interests, women may limit their number of children or they might desire a smaller family size. By having a small family, women are advantaged, not only in terms of increased time for other activities but also have more economic and social opportunities.

Women with higher education in Czech Republic were found to prolong the birth of their first child longer than it used to be in a socialist period (Klasen & Launov, 2006). They also found that women with undergraduate or higher degrees had stronger effects on fertility and the probability of exit from childbearing. An analysis of the relationship between fertility and level of education in sub-Saharan Africa by Chone (1995) has shown similar results – fertility is either curvilinear or negatively related with education but it did not appear very responsive to low level of education. Other similar studies by Martin (1995) and a specific study with reference to Bangladesh by (Akman, 2002) showed that higher education of women is consistently associated with lower fertility. For Bangladesh it was shown that the greatest impact of education on fertility occurs when levels of education are at secondary level. Low levels of primary education are not likely to have a significant impact (Akman, 2002).

Akin (2005) in a panel data analysis for Middle Eastern countries came out with results indicating that education of female in secondary and primary levels, female labour force participation and urbanization are negatively associated with fertility and tertiary education is negatively correlated but not significant. Thus, even though much of the literature shows that education has a negative relationship with fertility, the intensity and the direction of the impact might change with social environment. A similar result as expected was found in Vietnam, where both paternal and maternal education has statistically significant effects on the number of children ever born (Nguyen-Dinh, 1997).

The World Fertility Survey (1982) revealed that women with at least secondary education have number of children desired on average 1.0 to 2.5 less than women with minimal or no education. More educated women tend to be younger and to have fewer children than their uneducated counterparts. In addition, in Kenya, Jordan, Pakistan, Mexico and Venezuela, women in the highest educational category wanted about one child less than those in the lowest education category when accounting for differences in fertility. Based on this review, women who have high education are expected to have smaller CEB. Conversely, women with lower education are expected to have higher children ever born. A study done by (Cochrane, 1983), explains that education does not directly affect fertility but rather affects it through other variables. Fertility is determined by the biological supply of children, the demand for children by the husbands and wives, and regulation of fertility. The most important effect of education was hypothesized to be those influencing the proportion of marriage, age at marriage and health, particularly infant and child mortality and rise of contraceptive use (Martin, 1995). The most important demand effects appear to be the effect of education on the perceived costs and benefits of children and on family size preferences. The effect of education on the wife's market wage and occupation, meanwhile, is hypothesized to greatly affect the demand for children.

Other studies evaluated the direct relationship of women's education not only fertility but also on contraception which is a highly significant fertility proximate determinant. A Matlab study in Bangladesh observed that women with some education had higher contraceptive use than those who had no education (Razzaque, et. at., 1998). This is also because educational attainment alters parent's perceptions of the advantages of small families brings changes in the status of women, changes the social and economic aspirations, and affect attitude towards

contraception and ability to understand and make use of particular methods. The empirical findings of a number of studies have supported such an inverse relationship between education and fertility.

Therefore, of all the social factors that have been widely studied of their impact on fertility, women's educational attainment is the one that has proved most consistently and strongly related to fertility. It gives opportunities for participation in the outside world. It influences attitudes and perceptions. It gives openness to ideas. Education attainment especially of women is of the indicator of modernization and the status of women in society because it reflects the socio-economic status as well. Education gives rise to liberal attitudes towards the sex of the child (Sharma S., 1998). Education and women's participation in decision making is better educative women than uneducated women, so we can say that higher the educational attainment lower the fertility, lower the educational attainment higher the fertility. Bhawna Chawla has studied on Women's Education, Health and Fertility in 2007 and found that education is understood to have a positive link with a women's health and a negative correlation with fertility. Therefore, there is a close relationship between education and fertility, where fertility is highly affected by education.

2.8 Place of Residence

The unban-rural differential in fertility is one of the most widely studied areas in fertility. The fertility levels in urban and rural areas tend to be different (Boupha *et al*., 2005). The relationship between rural-urban residence and fertility has already been established wherein rural fertility is typically higher than urban fertility. Fertility decline almost already begins among the urban dwellers before spreading to the mass of population in the more traditional rural sector. (Bindary, 1973) concluded in their analysis of census data of Egypt that the child-women ratio rises with the level of female employment in rural areas and falls as the level of employment rises in the urban areas, implying an increase and decrease in fertility, respectively.

The Bangladesh Demographic Health Survey 2007, found higher number of children born for rural women than urban women. The Philippines is another country which exhibited higher children for rural women compared to their urban counterparts (Perez, 1994; Cruz, 2008). According to Perez (1994), the higher fertility among rural women is influenced by age at marriage, age at first sexual intercourse, educational attachment and contraceptive use. Women from urban areas are better educated and are more likely to practice contraception and postpone age at

marriage while their rural counterparts have earlier entry to marriage and sexual initiation and little awareness of contraceptives.

However, some studies contradicted this negative relationship between urban women and fertility. A study done in Pakistan in 1981 to understand the fertility differentials of women in urban and rural sectors found the urban TFR slightly exceeded the rural TFR, despite the lower urban and proportions married in the prime reproductive ages (Yusuf, 1981). It was also found that the urban marital fertility substantially exceeded rural marital fertility at the younger reproductive ages, but fell below it at the older reproductive ages. The study attributes shorter breast-feeding which reduces birth intervals and raises age-specific marital birth rates at the younger ages in urban women as a possible reason partly blames it on the poor quality of age reporting.

Women who lived in the urban area were more likely to use contraceptives than those who lived in rural areas. The fertility levels in urban and rural areas tend to be different (Boupha et al., 2005). A longitudinal study of Nepal's fertility trend based on the Demographic Health Survey in 1996 and 2001 illustrated that the estimates of fertility level of women in urban area were lower than women who lived in rural area, because of differences in contraceptives use (Rutherford and Thapa, 2003).

Women who are living in the urban areas have greater exposure to modernizing forces, such as the urban population contains a higher proportion of educated lots, the media, and a cash economy which might encourage small families and also raise aspirations for consumer goods. They also may feel their situations are constrained by scarce housing and employment uncertainties (Kent and Larson, 1982).

The World Fertility Survey (1982) revealed that in Mexico, Malaysia, and Turkey urban women want fewer children than rural women even after adjustments are made for differences in current family size. In Kenya, Jordan and Venezuela urban-rural differences are greatest. In rural areas, the adjusted mean number of children desired is one more than in urban areas (Kent and Larson, 1982). This study expects to find women who are living in the urban areas to have less number of children ever born than women who are living in rural areas. Generally, in Bhutan most educated women reside in urban areas.

2.9 Employment Status of Women

It has also been proposed that unemployed women were more likely to have higher pregnant frequency than employed women (Banerjee. B. , 2004). Women who have access to materials resources and social resources which can be measured by their work status and degree of economic earning capacity, knowledge and education, are expected to have higher status in the household or in the society. Gain in education and occupation may enable women to become decision makers in the household. In the other words, education and occupation may provide women economic independence that could elevate their status in the household or in the society, and further lead to the adoption of contraceptives and fertility reduction through spacing and limiting of births (Selvaratnam, 1990). (Beguy. D. , 2009) examined the impact of female employment on fertility in Dakar (Senegal) and Lome (Togo) and found that women in both places who have employment status had a longer birth interval than those who were unemployed, particularly those who were worked outside their homes.

In regard to work status or occupation, previous research found that generally employed women prefer to have fewer children than non-employed women. The main reason is attributed to incompatibility between working and childbearing activities. Therefore, it is widely recognized that women's work and fertility are inter dependent, both emerging from a family decision-making process that encompasses a number of goals, but both also reacting and interacting in response to a common set of social and economic forces, as well as to unfolding events over the life cycle (Luo, 2004).

Nevertheless, the relationship between work and fertility has remained contested. Research on the relationship between women's economic activity and fertility through the years among developed countries provided evidence of their negative association. Employed women reported healthier lifestyles and more health awareness than their unemployed counterparts. One impact of increased health awareness was that they had about half the previous pregnancies reported by housewives (El-Ghannam, 2005).

By contrast, women's employment in the urban setting is more likely to be incompatible with her maternal role, because that employment is outside her home and normally no alternative arrangements are available for taking care of young children while she is away for her work. However, in urban women workers are more likely to learn about birth control and have relatively easy access to family planning

services (United Nations, 1979). Previous studies also revealed that the desire to have a small family may come from having incompatibility between work and child rearing. At the individual and family level, women families who work outside the home are likely to limit their fertility and have smaller completed family size than women who do not work outside of home (Jordan, 1976).

Improvement in life expectancy, the rise in the real market wage, the spread of mass education, and the development of the welfare state were identified as the underlying causes (Luo, 2004). Female employment outside the home is also related to forming small families. Working women tend to have fewer children than those who do not work because employment entails alternative satisfaction to children (Blake, 1979).

Similarly, a study by El-Ghannam (2005) to understand the fertility differentials in less developed country (LDC) and more developed countries (MDC) found that women participation in non-agricultural economic activities outside the home has been shown to reduce fertility, mainly by increasing opportunity cost of children. As mentioned in study, women employed in white collar and technical occupations are likely to exile strong negative influence on fertility. EL-Ghannam (2005), in sum, concluded that raising both women's life expectancy and women's participation in labour force appears to be the most important means of lowering total fertility rate of women in LDCs and MDCs. Other contributing factors include adequate age at first marriage, rising educational attainment, and improving health care of women which also reduces child mortality rate. These factors help lower total fertility rate of the women in LDCs.

In addition, the maternal role incompatibility (MRI) hypothesis possessed that the labour force participation and fertility of women have reciprocal effect wherein women reduce the child bearing because of work demand and reduce their work because of child bearing demands (Luo, 2004). Although recent research suggested are weakening link between employment and fertility of women because of the availability of child care, family polices and changing attitude towards mothers (Rindfuss an Rewster, 1996, Engelhardt et al, 2002 as cited in Luo 2004).

To explain how employment may influence the fertility preference and fertility behavior, some researchers have used the role incompatibility or role conflict explanation. The role conflict theory may also help explain the discrepancies found in the employment fertility relationship between more developed and less developed countries and between rural and urban areas within one country.

Basically, the theory holds that when the mother and worker roles are compatible, no relationship should exceed between labour force status and fertility. In situations where these two roles are relatively incompatible, one should find a negative relationship (Weller, 1968). Thus, more conflict between women's roles as a mother and a worker, the more likely she to limit her fertility in an attempt to reduce the role conflict.

In a traditional or a rural setting, most females are engaged in agricultural jobs. Women's –care arrange employment also ends to take place in or near the home, thus making child-care arrangement less problematic and allowing household work to be shared by other family members. Joint occupancy of the roles of mother and worker is not overly difficult in these circumstances so women are more likely to have more children. Since children can help in the economic support of the family as an added hard in agricultural work. But in modern society, joint occupancy of the roles of worker and mother is much difficult for urban women employed in a factory or business. These women leave their home to go out for work so child care arrangements and domestics help have higher cost money and may be difficult to obtain. In these circumstances, employed women will have smaller completed family size than not employed women (Jordan, 1976). In this study, therefore, women who are working in the agricultural sector are expected to have higher fertility than women who are working in non-agricultural sector. The majority of women in Bhutan work in agricultural sector.

2.10 Labour Force Participation

The relationship between women's participation in the paid labour force and their fertility and contraceptive behavior is commonly conceptualized into two ways. The first main perspective emphasizes the opportunity cost of child bearing, focusing on how the prospect for career development and higher income may depress the women's fertility. The second perspective centers on the work care conflict, postulating that the less flexible the women's work schedule and arrangements are the more difficult it is for her to provide adequate care for her children. Therefore, she is more like to limit her fertility (Agadanian V., 2000)

Beside education, women's labour force participation is also considered as one of the significant indicator of women's status. Inspite of the fact that type of employment and amount of control over their own earnings are important factors in determining the status of women, to be on the economically productive side is thought to have some positive effects upon women's lives.

Earning their own money and being exposed to broader knowledge of the outside world gives women a certain kind of liberty and improves the self-image which they have of themselves. In this study, women's participation in the labour force has been taken as whether the respondent is currently working in a paid job or not.

2.11 Economic Participation

The level of economic activity of women is rather low in Bhutan and a disparity between the economic activity and the levels of the two sexes have always existed. In general, the proportion women in the labor force have always been far behind the proportion of men due to the gap in the level of education and training as well as cultural constraints. Generally speaking, the numbers of women who are in the work force are about half the number of men who work in Bhutan. Women are intensively employed in agriculture than are employed in industrial sectors. During the past four decades, with rural to urban migration women who are economically active in the agricultural sector have been withdrawn from the labour market. The low contribution of women to the economic activities rather than agriculture is due to their relatively low level of education which is not appropriate for the employment opportunity of urban areas. On the other hand, the participation of women in the urban economy is not reflected in labour statistics, since these women, many of whom are unskilled, usually work as domestic worker or do piece of work at their home without protection of social security. Women in Bhutan are generally in the position of family worker. Although the proportion of economically active women is very low in urban areas, parallel to the increasing level of education, women's participation in urban labour force increases.

2.12 Wealth Status

Wealth Status effects fertility through its effect on child survival which in-turn effects maternal mortality, environmental contamination, nutritional status, personal illness, and controlling the use of medical service. The 2005 Ethiopian women in the lowest wealth status have twice as many children as those in the highest wealth status. It is no wonder that the wealthy countries of the world have low fertility while most African countries plagued by poverty and illiteracy have, as a group, the highest fertility in the world (CSA, 2006).

Rios (1991) with an overview of Latin American Fertility trends states that increasing income will lead to fertility decreases as happened in Europe "Future

economic development in Latin America will cause income to rise, improve the wealth status and educational attainment of women and in future reduce the proportion of the population living in rural areas".

Beydoum (2001) in a study in Lebanon concluded that household's demand for a child is closely related to different services and utilities ascribed to that child. It is also claimed that fertility becomes positively associated with the household's wealth status when the notion of child-quality is added to the model. Findings confirm the baseline inverse association between an index of the household's wealth status and the cumulative fertility level. The lower the wealth status levels, higher the child mortality. Higher child mortality is followed by higher fertility within those extremely poor individuals (Dust. K. , 2005)

2.13 Participation in the Political Process

Inspite of relatively access and equal rights to participate in the political decision making mechanisms, women in Bhutan have had limited political involvement in terms of representation in the parliament as well as in the local government. Moreover, when participation in the parliament of Bhutan is considered, it is stated that the minimum qualification requirement is the formal university degree; whereas the women in the country who had obtained the university degree education is very low. In a similar manner, despite equality between the sexes was introduced in the legal structure through reforms in Turkey, especially to recognize the right to vote and to be elected at a rather early stage, in 1934 (Govern. of Turkey- UNICEF, 1991), the women's involvement in the political process in Turkey is very limited in terms of representation in the parliament.

2.14 Loss of Child

Many studies have demonstrated a strong relationship between child mortality and fertility. Child mortality was also found to have an impact on fertility (Palloni & Rafalimanana, 1997; Defo 1998). Typically, infant and young children have higher risks of mortality, if they are born to very young or older women. The child dead would increase the desire number of births because it is related to replacement of child who dies at an early age or the needed to insure the possibility to loss any child in the future (Preston 1978 cited in Ainsworth et. al 1998:140). Therefore, it has been argued that high infant and child dead is a cause of high fertility in many societies, because there is always need of new child to compensate. A study of the relationship between child mortality and fertility in Indonesia

conducted by Frankenberg (1998) showed that it had an impact on fertility level. Hence, this study considered that the factor child loss may have determined the fertility level in Bhutan, as high fertility is fundamental adjustment to high mortality and that high fertility is necessary for group survival where mortality is high (Bhende and Kanti Kar 2004).

2.15 Contraceptive

Contraceptive use was considered as one of the most important proximate determinants of aggregate level of fertility. Furthermore, it generally assumes the principle role in translation to lower fertility (Bongaarts, 1983b). By and large, it is found that an increase in contraceptive prevalence rates is consistent with an increase in the proportion of woman who needs to avoid pregnancy, which then leads to a decrease in fertility (Feyisetan, 2000).

Contraceptive use was considered as the most important proximate determinant of fertility by (Bongaarts, 1983a). Their assertion is consistent with offsetting of high fertility as a result of early marriage in Peru by increased contraceptive use (Bongaarts 2005). (Caldwell J.C. , 1982) posit that demand for contraception by young women was possibly the main cause of the rise in the age at marriage. It has been established that a rise in contraceptive use is the principle cause of decline in fertility (Bongaarts and Potter 1983). A strong correlation between contraceptive use and decline in fertility has been substantiated in Bangladesh (Cleland 1993) and in Thailand (Institute of Population Studies, Chulalongkorn University, 1987).

The prevalence of use of contraceptive methods increases with the increase in the number of living children as well as education level of the respondent (Sajid et al. 2005); (Azhar Saleem and G.R. Pasha. , 2008). Similarly this was found in Nepal where the sex preference was an important barrier to the increase of contraceptive use and the decline of fertility in the country (Tiziana et al., 2003). This was also found in rural Tanzania where the number of living children and education were the main factors in use of contraception (Marchant *et al*., 2004).

According to Kwame Boadu (2002) the fertility behavior in Ghana is influenced by a multitude of socio-demographic and economic, and cultural factors. These factors in turn, affect contraceptive practice in a variety of ways. The outcome of the analysis appears to support the view that knowledge of, and contraceptive adoption is gradually making an impact on fertility behavior in Ghana. Every use and current

use of contraceptives is not significantly associated with the level of fertility (Fantahun et.al, 2001; Getu A. and Alemayehu W., 2008; Samson and Mulugeta, 2009).

Modern medical care in Bhutan began in the early 1960s. In 1971 family planning was introduced in the health care delivery systems. During this first decade, family planning service had limited geographic coverage, and a narrow range of contraceptive methods were available. By 1980 family planning was integrated into the general health care system, and in 1981 the National Institute of Family Health (NIFH) was created, which expanded family planning throughout the country as an integrated service. Numerous activities were initiated from 1995 onwards. This includes high-level advocacy and campaigns on safe motherhood, adolescent reproductive health, family planning, prevention and management of complications of abortion, and management and prevention of STDS and HIV AIDs.

2.16 Methodology Review

(Ramesh Adhikari., 2010) investigates demographic, socio-economic and cultural factors affecting fertility differential in Nepal using NDHS 2006 data. He used both bivariate and multivariate analysis to describe the fertility differentials for ever married women of reproductive age (15-49). The bivariate analysis (one-way ANOVA) was applied to examine the association between children ever born and women's demographic, socio-economic, and cultural characteristics. Besides bivariate analysis, the net effect of each independent variable on the dependent variable after controlling for the effect of other predictors has also been measured through multivariate analysis (multiple linear regressions). The result indicates the mean numbers of children ever born (CEB) among married Nepali women of reproductive age under 40 and among women aged 40-49 were three and five children, respectively. Age at first marriage, perceived ideal number of children, place of residence, literacy status, religion, mass media exposure, use of family planning methods, household leadership, and experience of child death were used to explain in variance in fertility in the study.

(Toefiqua Mahfouz., 2009) examines the effects of some selected socio-economic and demographic variables on fertility using a well-known multivariate technique called path model analysis. The study argues that for both cohorts (i.e. aged 15-30 years and aged 30+ years) women's education, age at first marriage and length of breast feeding are found to have significant direct negative effects, while

the place of residence and number of child loss have significant direct positive effects on CEB.

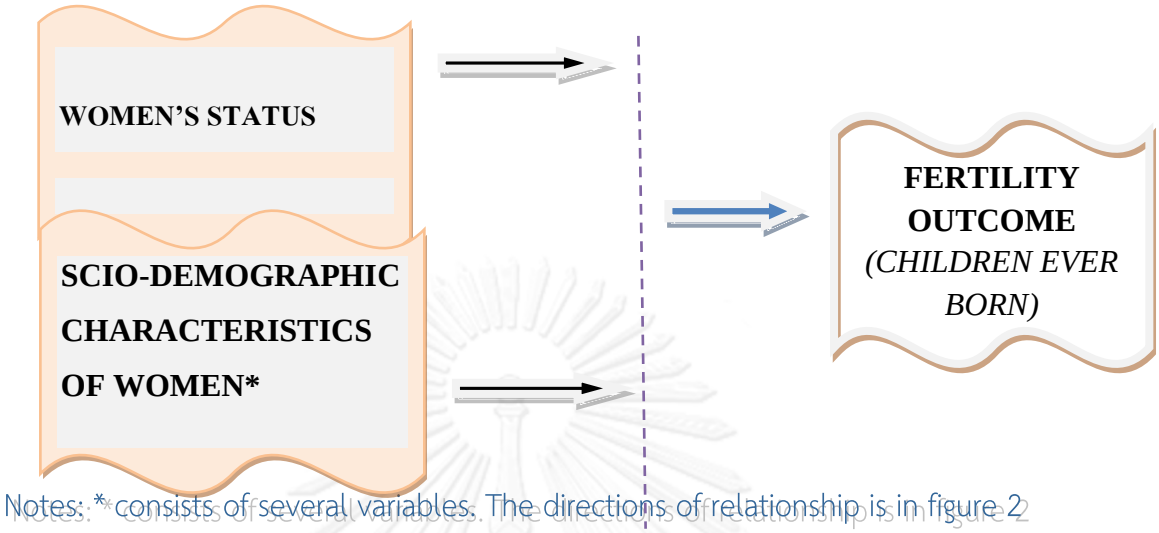
A cross-sectional, descriptive study with internal comparison was conducted among 1,376 women of reproductive age with the objective of assessing the level and determinants of fertility in Awassa town, Ethiopia by Samson and Mulugeta (2009). The study shows socio-demographic characteristics of mothers like low educational status, low or no income, rural place to birth, early marriage, and other variables like history or child death, negative attitude of husbands towards contraceptive use, poor educational status of husband, need for additional children, were found to have significant association with high fertility.

(Tewodros Alemayehu, 2010) studied the determinants of adolescent fertility in Ethiopia using the Ethiopian Demographic Health Survey 2005 (EDHS- 2005) data. Multiple logistic regression models were used to identify socio-demographic and economic determinants and Bongaarts model was used to determine proximate determinants of fertility. The result indicates that the major factors associated with adolescent fertility are age, educational status, place of residence, employment, marriage, contraceptive use and postpartum infecundability.

2.17 Conceptual and Analytical Framework

Based on the review of the available literature related to the issue of the study, the conceptual and analytical framework has been developed for the analysis of the "Impact of Women's Status on Fertility in Bhutan". Therefore, the first describes the linkages between the variables to be examined in this study. The conceptual framework (Figure 1) is based on the hypothesis that fertility outcome is greatly influenced by women's status and socio-demographic characteristics of women.

Figure 1: Conceptual Framework for the Study

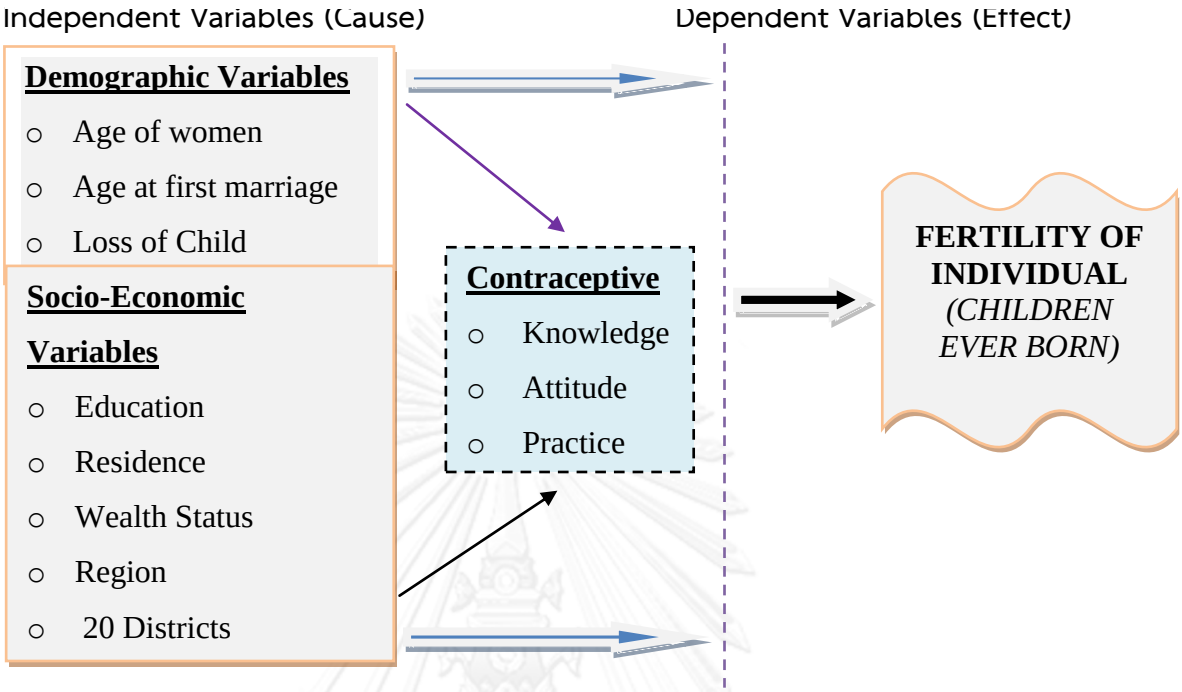


Notes: * consists of several variables. The directions of relationship is in figure 2

In this study, the fertility outcome of the women is expected to influence by: (i) the age of respondent (ii) age at first marriage (iii) level of education of women (iv) the urban or rural (v) wealth status (vi) child loss (vii) region of respondent and (viii) contraceptives. The relationships between status of women indicators, selected socio-demographic variables and fertility outcome are shown in Figure 2. The conceptual framework presented in Figure 2 further illustrates the association between explanatory variables and how they effect on children ever born. The conceptual framework speculates that demographic variables and socio-economic variables independently influence the outcome of fertility.

The demographic variables included in the study are age, age at first marriage and child loss of the respondent, while socio-economic variables are education, place of residence, wealth status and region or location. The unavailability of information on employment status, labour force participation, culture or tradition, occupation and religion, participation in political process prevented the present study from going beyond the available demographic and socio-economic data. Therefore, this conceptual framework is constructed based on the literature and the variables that are available in the data.

Figure 2: Analytical Framework for the Determinants of Fertility Outcomes



As envisaged in the conceptual framework, the dependent variable in this study is the fertility outcome that is the total number of children ever born alive to the person up to a specified reference date. The number of children ever born will be published for females aged 15-49. This is the most frequently used dependent variable in fertility analysis.

The independent variable: is the variable that is varied or manipulated by the researcher, which is the value, or the –output of the function. There are many independent variables in this study that are re-grouped according to the factors that affect fertility outcome. As stated in conceptual framework (Figure 2), it has been theorized that CEB be determined by various demographic and socio-economic variables.

2.18 Hypotheses

Further, on the basis of literature review and conceptual framework, the following hypotheses are formulated to test and assess the factors associated with the impact of women's status on fertility in the context of Bhutan.

1. It is hypnotized that women at older age are more likely to have higher CEB than the younger ones.
2. Women having rich/very rich wealth status are more likely to have fewer children than women with poor/very poor wealth status.

3. Women who married at younger age are more likely to have more children than women who married at older age.
4. Women with higher education level are more likely to have low CEB than low or no-education.
5. The CEB in urban and rural areas tend to be different.

Chapter III

RESEARCH METHODOLOGY

This present study was designed to describe the nature of association between women's status and fertility behavior. The study brings out the analysis of the casual relationship between the variables under study. Hence, this chapter discusses the methodology used for the determinants of fertility and its outcome of the number of children ever born, the data set used for operationalization and measurement of the entire variables, sampling design and the method of analysis.

3.1 Data Source

The data used in this study is the secondary data based on Bhutan Multiple Indicator Survey (BMIS) carried out in 2010 by the National Statistical Bureau (NSB) with the main objective to provide up-to-date information on the situation of children and women in Bhutan. The survey is nationally representative survey designed to furnish information on data required for monitoring progress towards the MDGs, the goals of A World Fit for Children and other internationals goals. It also helps to strength technical expertise in the design, implementation, and data analysis of similar surveys in future. The data also includes socio-economic characteristics of households along with demographic indicators of individuals' women of reproductive age.

3.2 Sample Design

The sample for the Bhutan Multiple Indicator Survey (BMIS) was designed to provide estimates for a large number of indicators on the situation of women and children. Of the 15,400 households selected for the sample, 14,676 households were successfully interviewed for a household response. Within those interviewed households, 16,823 of the eligible women in their reproductive age (15-49) were identified from the household questionnaire. Of these, 14,018 women were successfully interviewed on their characteristic backgrounds. Due to many variables used in this analysis are linked with women who had children ever born, only ever married women who had experience with child birth are selected as samples in this study.

Inclusion criteria: Women, aged 15 -49 and who are ever married.

Exclusion criteria: Women, not at home, refused, partly completed, incapacitated and others.

The information regarding urban/rural residence, educational attainment, wealth status, regions and from 20 Dzongkhags focuses on women 15-49 years old, since the study concerns fertility and births rarely happen to girls less than 15 years of age or women older than 49. Moreover, the data on fertility was collected for ever married women of aged 15-49 years to obtain information about respondent's background characteristics. The following responses of the women were considered for the operationalization of the variable for the differential analysis:

i. Level of education completed;
ii. Number of children born in her lifetime;
iii. Wealth status;
iv. Place of Residence; and
v. Use of contraceptives.

Therefore, all of the data in this study is based on the Bhutan Multiple Indicator Survey (BMIS 2010). The BMIS questions for each of the selected variables in this study are as shown hereunder:

Table 1: Selected Variables and Questions from the Bhutan Multiple Indicator Survey, 2010

Variables	Questions
Number of children ever born	a. How many children have you ever born alive? b. Have you ever given birth to a child who was born alive but later died?
Residence	Area..... (1) Urban (2) Rural
Age	How old are you? (.....age in completed years)
Education	What is the highest level of school you attended?
Wealth status	What do you think of your socio-economic status relative to others in the neighborhood?
Age at first marriage	How old were you when you started living with your first husband?

3.3 Operational Definition of Variables

3.3.1 Dependent Variable

The dependent variable for this analysis is individual fertility, identified as the number of children born (CEB) alive (life time fertility) to the respondent up to the survey date. This was measured by the question on the individual respondent's number of children ever born based on women's status. A live-born child is generally defined as one who cries after birth.

Children Ever Born: In this study fertility outcome is operationalized as children ever born (CEB) which will be measured as the number of children born alive to the person up to a specified reference date. This will be measured by the question on the respondent's number of children and the number of children died after giving birth. It does not include stillborn, abortions or children adopted by the person. CEB does allow for the generalization of data and understanding that can provide the basis for further analysis. The choice of this variable is based on its closeness to the concept of individual fertility. In most fertility survey this information is obtained through a direct question on total number of live births. In this study, the CEB was further classified into the following categories: no children (1); 1-child (2); 2-3 children (3); and 4 children or more (4). Similar categorization of children ever born into three groups was considered when conducting a study on impact of female education on fertility (Irshad Khan on June 2012). Moreover, children ever born was used as dependent variable and categorized into two groups when conducting a study on determinants of some socio-demographic characteristics on fertility in Ethiopia (Kidus Yosef, June 2012).

3.3.2 Independent Variables

The following explanatory variables were selected for inclusion in the analysis by considering partly the evident strength of their significant relationship to CEB observed in previous comparable studies or on their hypothesized association with CEB and partly on practical grounds of data availability. All the independent variables were obtained from the various sections on the women questionnaire. To make analysis and interpretation simpler and more meaningful, some variables were regrouped/ recoded from their original in the dataset. The Table 2 describes the variables used in the analysis.

Age of Women: Based on the age of the respondent recorded at the time of interview was classified into the standard seven year age group (15-19; 20-24; 25-29;

30-34; 35-39; 40-44; and 45-49). The age of respondent at the time of her first marriage is categorized as either below 18 or 18 years old and above. Age 18 is the legal age at marriage for Bhutanese women.

Age at the First Marriage: that is, the age at which a woman enters first union. Generally, women who marry young will have had a longer duration of marriage and have born more children. Women, who marry early, for example at age fifteen, have roughly twice as many years of productivity as those marrying at age 30. Therefore, the age of respondent at the time of her first marriage is categorized as either below 18 or 18 years old and above. In Bhutan as well as in many other countries, persons gain specific rights such as marriage and voting rights, with age. Women in Bhutan have the right to legally marry at age of 18 and can legally vote the same age. The law in Bhutan considers a person who is 18 years as mature, able to make decisions and is accepted to engage in sexual activity.

Child Loss: Refers to experiences of the respondents, whether they had child died. Assessing into two categories (1) no child loss experience, and (2) having experience of child loss.

Education: This variable describes the level of school attended by a woman. This has been derived from a question asked of the women about her level of educational attainment. Consequently, educational outcomes were assessed by re-grouping into the standard classification covered six categories as (1) no education; (2) primary; (3) lower secondary); (4) middle secondary (5) higher secondary; and (6) college/university.

Wealth Status: Wealth is the indicator of socio-economic position that most directly measures the material resources component, and can influence a wide range of material circumstances with direct implications on fertility. In this study wealth status is categorized: (1) very rich; (20 rich; (3) moderate; (4) poor; (5) very poor.

Residence: This refers to whether the woman is residing in an urban or rural place. The categorization of a location into urban or rural was done before survey was conducted. Residence, which is defined as the place where the respondent resides, is the dichotomous variable taking the value 1 for urban and 2 for rural areas.

Region: The study included a geographical variable region which had three categories namely: West, Central and Eastern regions based on the location.

Dzongkhags: The district or the sub-national level in Bhutan. There are presently twenty districts in Bhutan.

Contraceptive Use: This variable is assesses as whether or not a woman has ever used any contraceptive method. The independent variable contraceptive use was obtained from question in the section on contraception in the individual women's questionnaire. Women were asked the question: are you currently doing something or using any method of contraception to delay or avoid getting pregnant? Consequently, the variable is measured as dichotomous variable taking the value 1 if the woman has ever used a contraceptive method and the value 2 if she has never used a method.

Table 2: Descriptions of Variables and Scale of Measurements

Variable	Definition	Scale
<u>Dependent Variable</u>		
Children Ever Born (CEB)	number of children born alive to the person	**Ordinal** 1 = No children 2 = 1- child 3 = 2-3 children 4 = 4 children or more
<u>Independent Variables</u>		**Ordinal**
Age	Age of the mother in completed years by the seven years of groups	1 = 15 - 19 2 = 20 - 24 3 = 25 - 29 4 = 30 - 34 5 = 35 - 39 6 = 40 - 44 7 = 45 - 49
Education	Level of education attained by women	**Nominal** 1 = No Education 2 = Primary 3 = Lower Secondary 4 = Middle Secondary 5 = Higher Secondary 6 = College/university

Variable Dependent Variable	Definition	Scale
Wealth Status	Socio-economic position	**Nominal** 1 = Very rich 2 = Rich 3 = Moderate 4 = Poor 5 = Very poor
Region	Country will be divided into three major regions	**Nominal** 1 = West 2 = Central 3 = East
Residence	Stratum of residence	**Nominal** 1 = Urban 2 = rural
Age at First Marriage	At which a woman enters into first union with her husband	**Nominal** 1 = 15 - 17 Years 2 = 18 years old and above
Child Loss	Ever given birth experience but later the children dying	**Nominal** 1 = Yes 2 = No
Contraceptive	Whether or not a woman has ever used any contraceptive methods	**Nominal** 1 = Ever used 2 = Never used

3.4 Data Processing and Methods of Statistical Analysis

In this study, descriptive and inferential statistics were estimated for data analysis using the statistical package for social sciences (SPSS) version 17.0 and computer software called Microsoft Excel 2007. Three statistical approaches of data analysis are employed in this study.

Firstly, descriptive univariate statistics analysis were performed to describe respondent's characteristics and also to inspect the frequency distributions of the variables.

Secondly, since the objective of the study is to know the relationship between dependent and independent variables, bivariate analysis was employed to examine the direct association of the independent variables and children ever born. The chi-square test with cross-tabulation were performed to establish statistical association between the two variables and subsequently presented in the tables. It is one of the simplest and most widely used non-parametric tests in statistical analysis. Furthermore, the Means was applied to find the average-values of CEB and also to test the association between dependent and independent variables.

3.5 Mean was used to find the average-value and it takes the form as hereunder

The mean (also known as average) is obtained by dividing the sum of observed values by the number of observations (N). Although data points fall above, below, or on the mean, it can be considered a good estimate to predicting subsequent data points. The formula for the mean is provided as equation (3.1).

$$Mean\ \bar{X} = \frac{\sum X_i}{N} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3.1)$$

Mean $\bar{X}$ … … … … … … … … … … … … is the average value of dimensions

X_i … … … … … … … … … … … … … … . . is the each score of the dimension

N … … … … … … … … … … … … … … . . is the total number of respondents score

As prescribed above, the mean is a measure of the centrality of a set of data. Therefore, the mean value in this study was computed by the summation of all the scores of each respondent divided by the total number of respondent.

3.6 Standard deviation used to measure the dispersion of data from its mean

The standard deviation gives an idea of how close the entire set of data is to the average value. The more spread apart the data, higher the deviation. This means, data sets with small standard deviation have tightly grouped, precise data. Data sets with large standard deviations have data spread out over a wide range of values. The formula for standard deviation is given below as equation (3.2).

$$\sigma = \frac{\sum (X_i - \bar{X})^2}{n-1} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3.2)$$

$\overline{X}$ … … … … … … … … … … … … … … . . is the mean – average

X_i … … … … … … … … … … … … … … … . is the each score of each respondent

N … … … … … … … … … … … … … … … . is the total number of respondents

i … … … … … … … … … … … … … … . . is 1, 2, 3, 4, 5, 6, 7 … … … ….

3.7 The chi-square takes the form as hereunder

$$x^2 = \sum_{j=1}^{r} \sum_{i=1}^{k} = \frac{(F_{ji} - E_{ji})^2}{E_{ji}} \quad \ldots \ldots \ldots \ldots (3.3)$$

Where; i = 1, 2, … … … … … … … … … … . … … . . , k.

Where; j = 1, 2, … … … … … … … … … . . … … … . . , r.

F_{ji} = Observed frequency.

E_{ji} = Expected frequency.

k = Number of categories of the dependent variable

r = Number of categories of the independent variable

3.8 Multinomial logistic model was used and it takes the form as hereunder

The multinomial logistic regression model allows the effects of the explanatory variables to be assessed across all the logit models and provides estimates of the overall significance (i.e., for all comparisons rather than each

individual comparison). The general multinomial logistic regression model is shown in equation 3.4.

$$Log\left(\frac{\rho_{ij}}{\rho_{ij}}\right) = \beta_{0i} + \beta_{i1}x_{1j} + \beta_{i2}x_{2j} + \beta_{i3}x_{3j} \ldots\ldots\ldots\ldots + \beta_{ik}x_{kj} + \in \ldots\ldots\ldots\ldots, 1,2,3 \ldots\ldots (3.4)$$

ρ_{ij} is the probability of of the i^{th} category (the probability of either, being no children, 1 child, $2-3$ children and 4 or more children)

ρ_{1j} ……. is the probability of children ever born (CEB)

x_i ……. is a particular explanatory variable

β_0 ……. is the constant

β_s ……. are regression parameter estimates

x_s ……. are independent variables

$\in$.....is the error term

Multinomial logistic regression was used to determine the directions and strength of the relationships between explanatory variables and children ever born in Bhutan. The model was used because the dependent variable which is CEB has been classified into 4 categories: (1) no children; (2) 1-child; (3) 2-3 children; and (4) 4 children or more. The use of multinomial logistic regression is based on the fact that dependent variable has more than two categories.

3.9 Multinomial Logistic Regression

Multinomial logistic regression is used to analyses relationships between the dependent and independent variables. The multinomial regression model compares

multiple groups through a combination of binary logistic regressions. The basic concept was generalized from binary logistic regression (Hosmer & Lemeshow 2000, Aldrich & Nelson 1984. The group comparisons are equivalent to the comparisons for a dummy-coded dependent variable. In a multinomial logistic regression model, the estimates for the parameter can be identified compared to a baseline category (Long, 1997). In this study, having no children category is set to be the reference group. Therefore, we can generalize how the multinomial regression analysis would work in this study. We had 4 groups, and we set group 1 to be the baseline group. The multinomial regression would have 3 sets of results, and Exp(B) column would be predicting the odds of :

- Being in group 2 (as compared to group 1)
- Being in group 3 (as compared to group 1)
- Being in group 4 (as compared to group 1)

This allowed us to assess the odds of 1-child category versus no children; the odds of 2-3 children category versus no children; and the odds of 4 or more children versus no children category accordingly. The multinomial logistic regression model can be a useful tool for modeling where the dependent variable is a discrete set of more than two choices (Agresti, 1996). As indicated above, using the multinomial regression model provides a set of odd ratios for each of the two comparisons. The odds for the reference group are all one, similar to the odd ratios for the reference group for a dummy coded variable. As stated above, it is like performing three binary logistic regressions where the first binary regression will treat 1-child category as 1 and having no children as 0; the second binary regression will treat 2-3 children as 1 and having no children as 0; and 4 children or more category as 1 and having no children as 0.

3.10 Results Interpretation

The null hypothesis is always assumed to be true unless proven otherwise. An alternative hypothesis predicts the opposite of the null hypothesis and is said to be true if the null hypothesis proven to be false. Consequently, the p-value proves or disproves the null hypothesis based on its significance. A p-value is said to be significant if it is less than the level of significance. The significant differences in this study were determined using chi-square at $p < 0.05$. If observed significance level of test is small, for example less than 0.05, then the null hypothesis were accepted and the alternative hypothesis was rejected. This meant that a probability values at p-value < 0.05 was considered statistically significant in this study.

Chapter IV

STATISTICAL DATA ANALYSIS AND FINDINGS

This chapter presents the results of the analysis of socio-demographic factors that may have impact on CEB by a woman in Bhutan. The data used in this study for the analysis comes from the 2010 Bhutan Multiple Indicators Survey (BMIS) carried out by National Statistical Bureau (NSB) with reference to women in the age class 15-49 years. The dependent variable children ever born are categorized into: no children; 1-child; 2-3 children; and 4 children or more. Descriptive and multinomial logistic regression methods were used to measure the effects of socio-demographic factors that affect total CEB in Bhutan.

Accordingly, results of this study are present in three sections, the first deals with descriptive univariate analysis on characteristics of the respondent. Second section is the bivariate analysis, which provides percentages by using cross-tabulations with Pearson chi-square test and the comparison of mean-values of individual fertility from several independent key variables. The third section is the presentation of multivariate analysis by using the multinomial logistic regression analysis to test the effect of independent variables, and other variables on children ever born. The data are analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 and computer software called Microsoft Excel 2007.

4.1 Descriptive Univariate Analysis

In this study, a description of the demographic characteristic and social characteristics was presented. Frequencies and proportion characteristics of the study population with regard to key socio-demographic variables such as age, age at first marriage, education, residence, wealth status, child loss, region of the respondent and use of contraceptives were presented. The total sample for this analysis comprises 16,823 ever married women. Of which, 14,018 women in reproductive age (15-49) years old who had children ever born were completely interviewed during the 2010 (BMIS) survey conducted by national statistical bureau in Bhutan.

4.1.1 Children Ever Born (CEB)

The sample characteristic in the Table 3 reveals that the mean number of children ever born of respondents is 2.58 with a standard deviation of 1.12 and median 3.0. The Table shows that mainstream of the women about 34.8 percent reported 2-3 children ever born, and nearly 26.1 percent had reported no children.

Furthermore, 24.5 percent of all women had 4 or more children, while 14.6 percent had 1-child born reported during the interview.

Table 3: Percent Distribution of Respondent by Children Ever Born in 4 Groups

Variable		Number	Percent
Children Ever Born	No children	3662	26.1
	1-child	2044	14.6
	2 - 3 children	4875	34.8
	4 children or more	3437	24.5
	Total	**14018**	**100.0**
Mean: 2.26	Median: 2.0	SD: 2.05	Range: 0 - 13

4.1.2 Age of Respondent

Age is a demographic factor which plays a vital role in determining the knowledge and behavior on fertility and number of children born. The distribution of age groups of the respondent is shown in Figure 3. The mean age of the sample is 30.22 years with the majority sampled respondent in age class 25-29 and 20-24 years, which is about (18.9% and 17.4%) respectively. This is followed by age 30-34 years with 16.1 percent and 15-19 years is about 14.1 percent. The Figure also reveals that most of the respondents in the age group 35-39 and 40-44 years where (13.4% and 11.8%). The least numbers are in 45-49 age groups, which is about 8.4% of total sample respondent. Overall, Figure shows that there is a combine number of respondent.

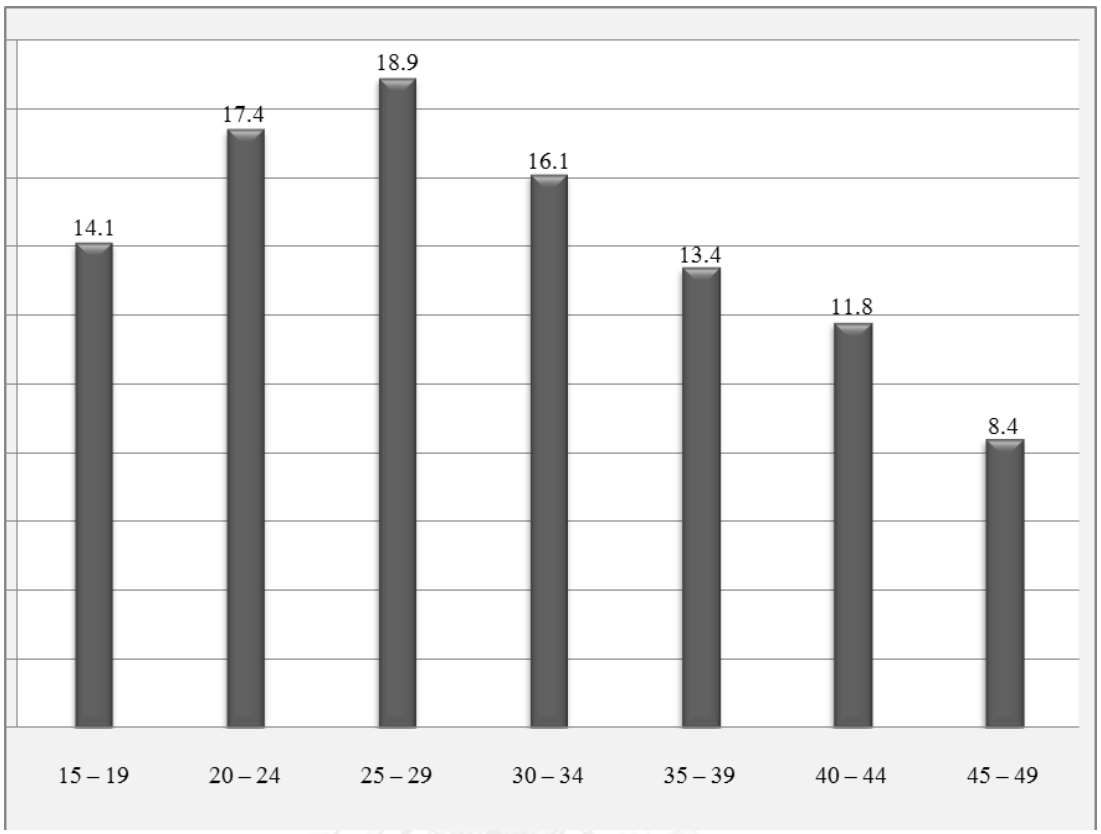


Figure 3: Percent Distribution by Age

4.1.3 Age at First Marriage

Age at first marriage is the one of the determinants of fertility. As recorded in Figure 4, the mean age at first marriage of the sample is 19.49 years with the majority of the respondents married at age 18 years and above, especially in the urban areas. The proportion of women who married 15-17 years of age is 29.9 percent, while a considerable proportion of the women (70.1%) married at the age of 18 and above of the total respondent. The percentage of women who got married at age 18 years and below is more likely lower than women who married at the age 18 years and above during the conduct of survey.

Marriage at younger ages has decreased modestly in Bhutan as time changes and due to the increment of the level of education and more awareness campaign conducted on the use of contraceptives. Thereby, many people in most of the rural areas who feels burden to keep their unmarried daughter at home when she cross age 15 plus is now no more in practice around the country.

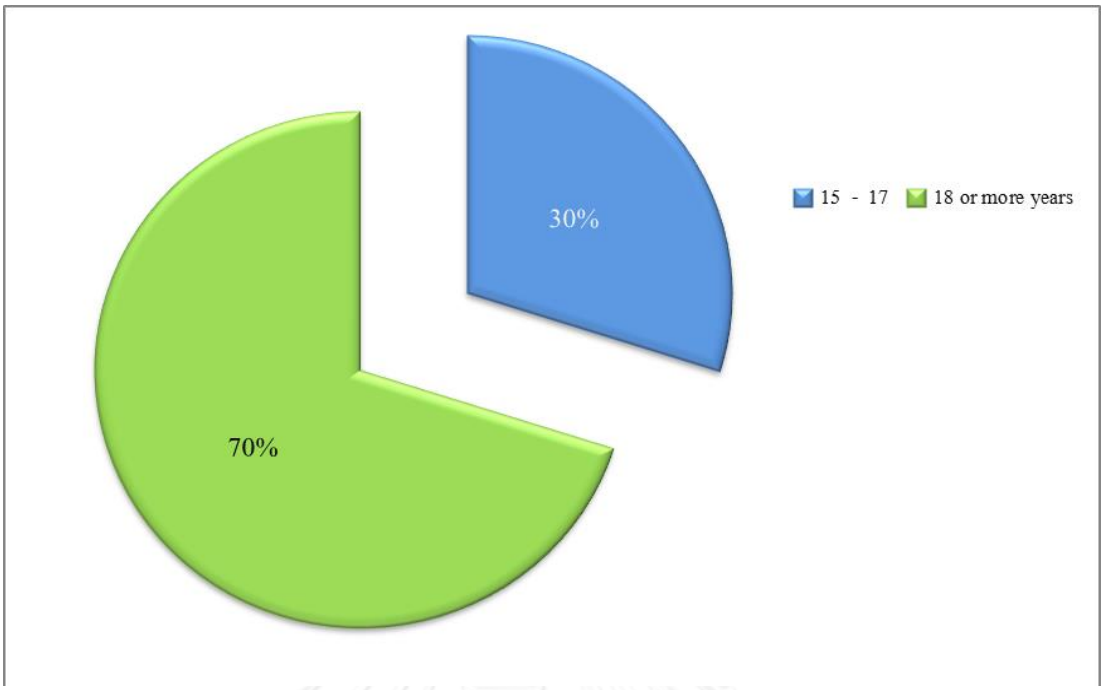


Figure 4: Percent Distribution by Age at first Marriage

4.1.4 Educational Attainment

Education of women has been linked with fertility. The findings in the Figure 5 indicate that most of the respondents had no education or at the most primary schooling (63.5% and 12.2%) respectively, while proportions of respondent having lower secondary is 6.5%, having middle secondary is about 10%, and higher secondary schooling is 5.5%. Only 2.3 percent of the total respondent reported having tertiary or college education, representing very low educational attainment of college/university schooling by women in the country.

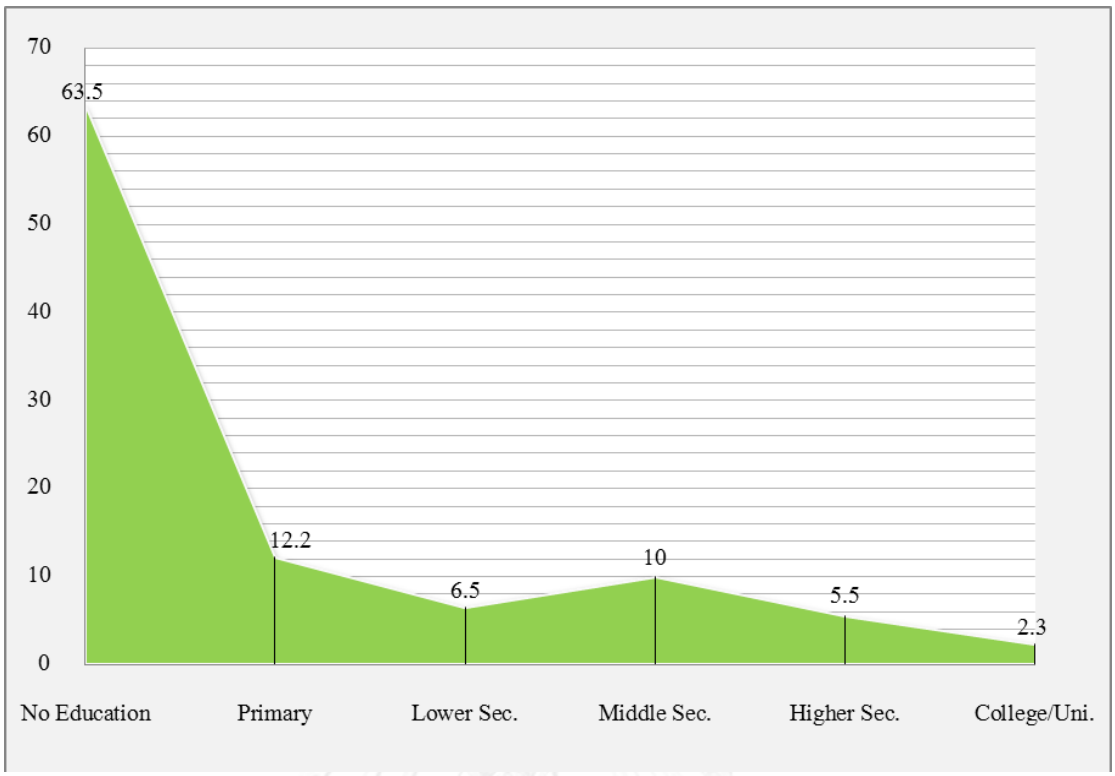


Figure 5: Percent Distribution by Education

It must be noted that the Royal Government of Bhutan has a national policy for universal education, thereby providing every child the right to free schooling. It also sets the national literacy rate of 80 percent by 2013 and 100 percent by 2015. This policy appears to influence the attendance of children in the primary school. On the other hand, the highest percentage of respondent reported having low education (no education, primary school and lower secondary) is because the majority of respondents reported in this study are in the rural.

4.1.5 Residence

Place of residence plays a critical role in determining the fertility. As shown in Table 4, almost of the sample women included in this study resided in rural areas (77%), while the percentage of women dwelling in urban areas is (23%) only. This means that the rural women are over represented in the study indicating that most of the people in the country at the time of survey were living in rural areas.

Table 4: Percent Distribution of Respondent by Place of Residence

Variable		Number	Percent
Place of Residence	Urban	3872	23.0
	Rural	12951	77.0
	Total	**16823**	**100.0**

However, the percentage of people who are living in urban areas keeps on increasing because of many people moving or migrating from the rural areas to the urban areas. Besides, the percentage distribution of urban and rural groups showed comparatively big in difference.

4.1.6 Wealth Status

The wealth status also plays a critical role in determining the fertility status of that place. The wealth status of the respondent is presented in Figure 6. Based on the wealth index computed for this study, the majority of respondents have moderate wealth status which consists of 21.1% followed by poor wealth status which accounts for 20.7% and almost 20.5% could be categorized as rich. Nearly, about 19% of women knock down into the very rich and 18.7% into very poor wealth status of the total respondent respectively.

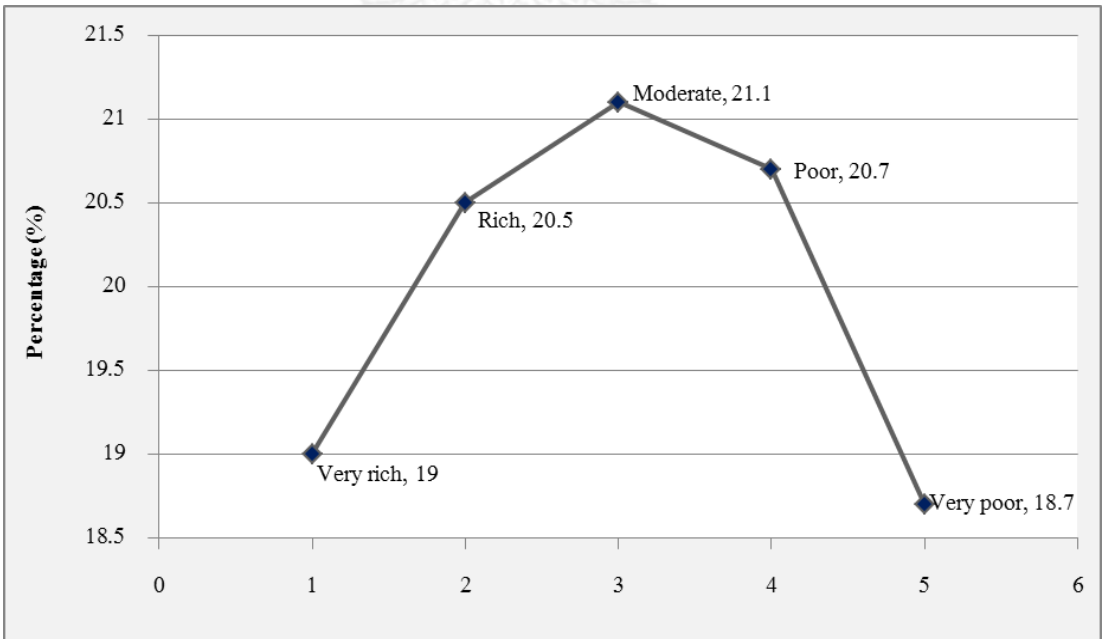


Figure 6: Percent Distribution by Wealth Status

4.1.7 Child Loss

Overwhelmingly, the Table 5 reveals that more than 85.7 percent had never experienced child loss, while only about 14.3 percent had the experience of child loss of the total respondent.

Table 5: Percent Distribution of Respondent by Child Loss

Variable		Number	Percent
Child Loss	Yes	2008	14.3
	No	12010	85.7
	Total	**14018**	**100.0**

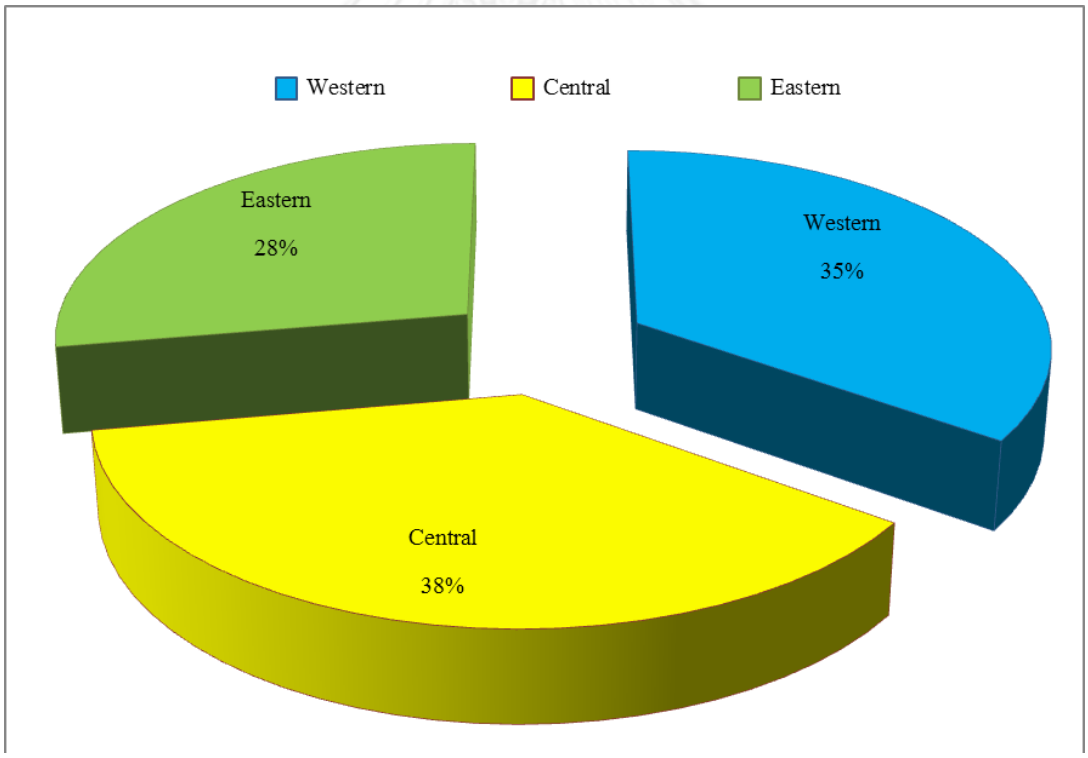


Figure 7: Percent Distribution by Region

4.1.8 Region

The Bhutan was divided into three major regions i.e. the eastern region, central region and western region. The Figure 7 presents region-wise total respondents where the majority of women included in this study were in the central region which

consists of (37.5%), followed by western region (34.8%) and then eastern region (27.7%).

4.1.9 Contraceptive Methods

The use of contraceptive methods helps women to avoid more number of children ever born. Respondent were asked about their ever used and never used of any contraceptive methods. The responses are presented in Figure 8.

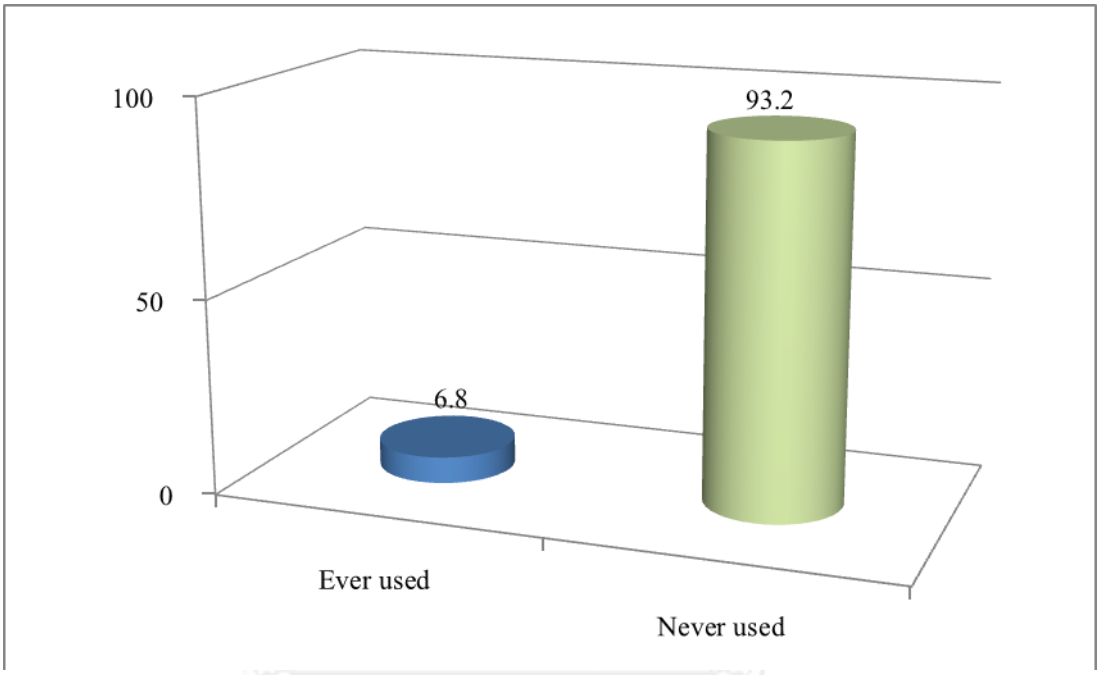


Figure 8: Percent Distribution of Respondent by Contraceptives

Surprisingly, it is notable that more than 93.2 percent of the respondent had never used contraceptive methods. It is clear that only few respondents used the contraceptives method which is accounted for 6.8 percent. This shows that less proportion of women have heard and practicing about methods and this is actually due to they are not fully not known and aware of the contraceptives and about fertility control material.

4.1.10 20 Dzongkhags

Bhutan was further divided into 20 Dzongkhags. The Dzongkhag-wise total respondents are presented in Figure 9. The highest respondent of the sample is 5.9 percent from Bumthang Dzongkhag, followed by 5.8 percent of Thimphu Dzongkhag.

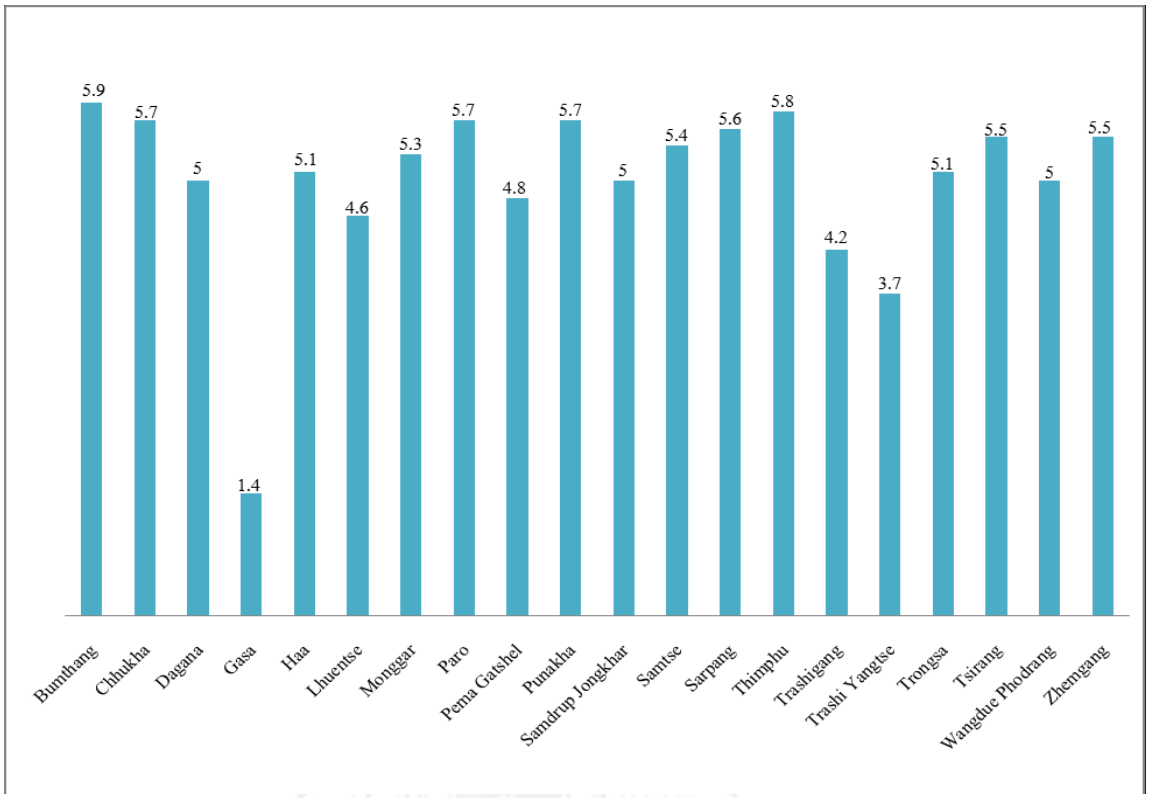


Figure 9: Percent Distribution of Respondent by 20 Dzongkhags

More interestingly, all three Dzongkhags of Chhukha, Paro and Punakha are having the total respondent of 5.7 percent each. The least number amongst all are from Gasa Dzongkhag which have only 234 respondents i.e. about 1.4 percent, chased by Trashi Yangtse Dzongkhag with 3.7 percent of the total respondent. Gasa is situated in the extreme northwest of the country. The Dzongkhag has one of the largest total areas of the country, but with the smallest population of all the 20 Dzongkhags.

Overall, the Figure shows that there is combine number of respondent as per the actual allocation of the total population in the respective Dzongkhag.

4.2 Bivariate Analysis

The purpose of this analysis is to examine the significant bivariate relationships and statistical tests between the independent variables and dependent variable. Furthermore, the dependent and independent variables were cross-tabulated to identify if there exist a significant relationship between the variables. The dependent variable is children ever born, and the independent variables were age, age at first marriage, education level, residence, wealth status, child loss, region of the respondent, and the use of contraceptive methods. The mean value was

calculated to compare the number of mean between the variables. Subsequently, in this section, Pearson chi-square was also used to assess the level of association between dependent variable and explanatory variables. A relationship was said to be significant if the derived p-value was less or equal to 0.05.

4.2.1 Age of Respondents

A significant relationship was established between children ever born and the age of respondent in the study (chi-square value: 10654.188; df: 18; and $p < 0.0001$).

Table 6: Percent Distribution of Children Ever Born by Age Group

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Age Group	[15 - 19]	90.4	8.3	1.3	.0	1974
	[20 - 24]	44.1	33.3	22.1	.5	2435
	[25 - 29]	17.8	23.8	51.2	7.2	2651
	[30 - 34]	6.5	10.2	56.8	26.5	2261
	[35 - 39]	3.8	5.3	44.9	45.9	1872
	[40 - 44]	4.4	4.1	30.7	60.8	1651
	[45 - 49]	3.4	3.6	27.3	65.7	1174
Total						**14018**
$x^2 = 10654.188^*$			p = 0.0001		DF: 18	

The Table 6 reveals that 90.4 percent of the women in the age 15-19 years have no children born. Therefore, marriage taking place at early ages in Bhutan has been reduced, in general. Moreover, the age of women giving for the first-child birth has increased in Bhutan. For instance, the women aged 20-24 consists the maximum (33.3%) of having 1-child, indicating the majority of women in this age group conceived her first child. This percentage was followed by women in 25-29 years age class (51.2%) and moreover tends to have 2-3 children. After this age group, most of the women (56.8%) in age class 30-34 years also more likely to have 2-3 children. About 45.9 percent of women in 35-39 years age group have 4 children or more.

Similarly, 60.8 percent and 65.7 percent of women in 40-44 and 45-49 years of age groups also have 4 or more children respectively.

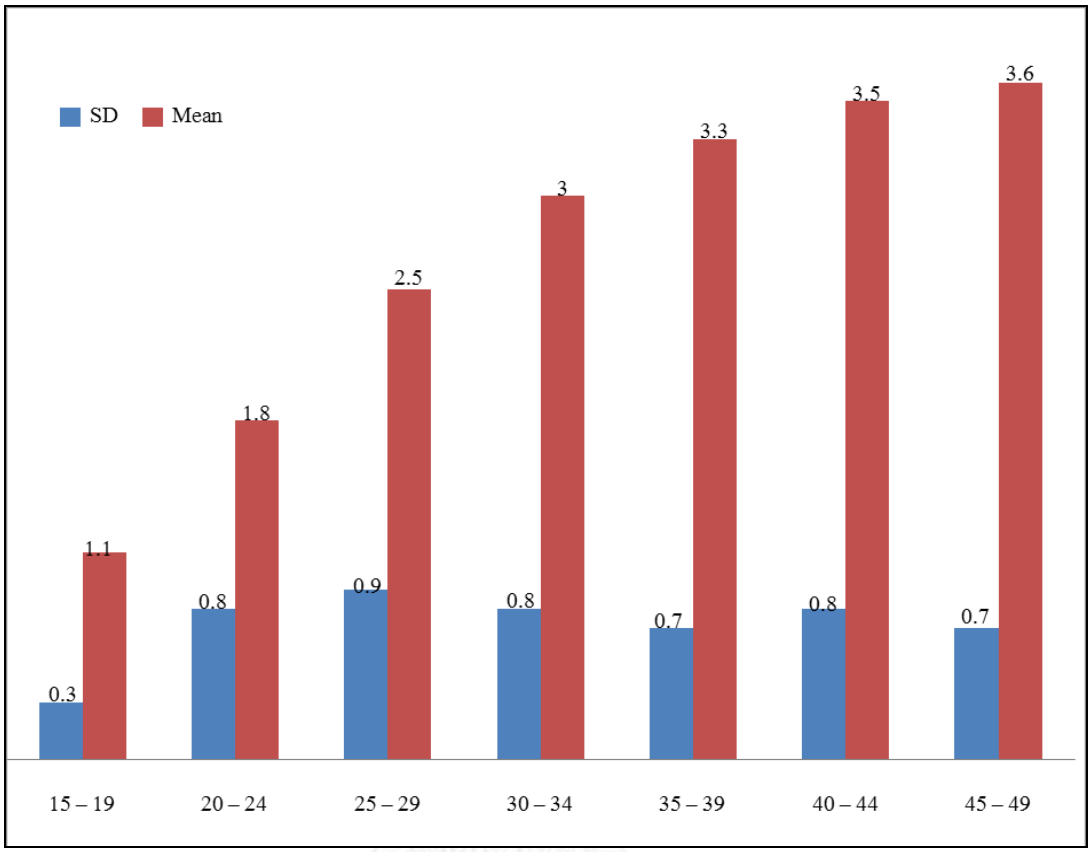


Figure 10: Mean value of CEB by Age

It was learned from the Figure 10 that the mean value of children ever born appear smaller among the women in the young age groups compared with those in older age groups. The average children born of the women in 15-19 age groups was (1.1) and for older women 45-49 age groups who are nearing the end of their reproductive period is (3.6). Similarly, the mean number of CEB of women age groups from 20-24 is (1.8) and from 40-45 is (3.5) respectively. Whereas, the mean-value of women age group from 25-29 is (2.5), age group from 30-34 is (3), followed by women age group from 35-39 with mean number of CEB is (3.3). Therefore, from the Figure 10, it is hypothetically obvious that children ever born increases as age of women increases and decreases whenever age of women decrease. These results are consistent with the studies of (Kamnuansilpa P, 1985) in Thailand and Nazareth and Chavez (1974) in Philippines. The younger women are more likely to have fewer children born than older women.

4.2.2 Age at First Marriage

Other demographic factors which influence children ever born are the age at first marriage. This factor is closely associated with current age and it tends to present the same relationship with children ever born. Generally, women who marry young will have had a longer duration of marriage and have born more children than other women. Their number of children born tends to be larger also (Kent and Larson, 1982).

The Figure 11 shows that 37.5 percent of those who married before they reached the legal age at marriage (before 18 years) have children ever born of 4 or more, while only 26.7 percent of those who married after the legal age have children ever born of 4 or more. It has been hypothetically proved that, those who marry at younger age will give more birth (37.5%) that is 4 children or more, while those who marry at older age will preferably give less birth (26.7%), that is 4 children or less. Most of those who got married after age 18 are likely to have smaller number of CEB. About 8.9 percent of these women have no children; about 21.3 percent had 1-child and 43.1 percent having 2-3 children.

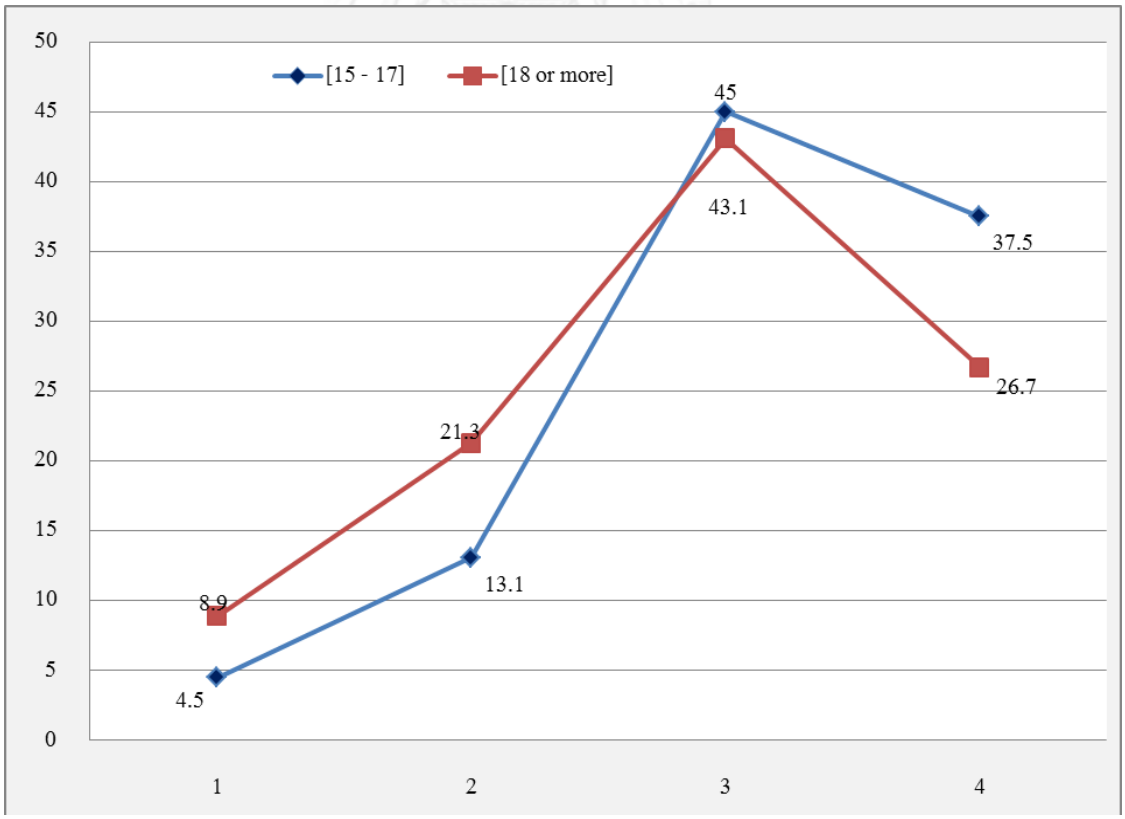


Figure 11: Percent Distribution of CEB by Age at First Marraige

The statistical analysis using chi-square test also revealed that there is a significant relationship between age at first marriage and children ever born (chi-square value: 214.944; df: 3; and $p < 0.000$).

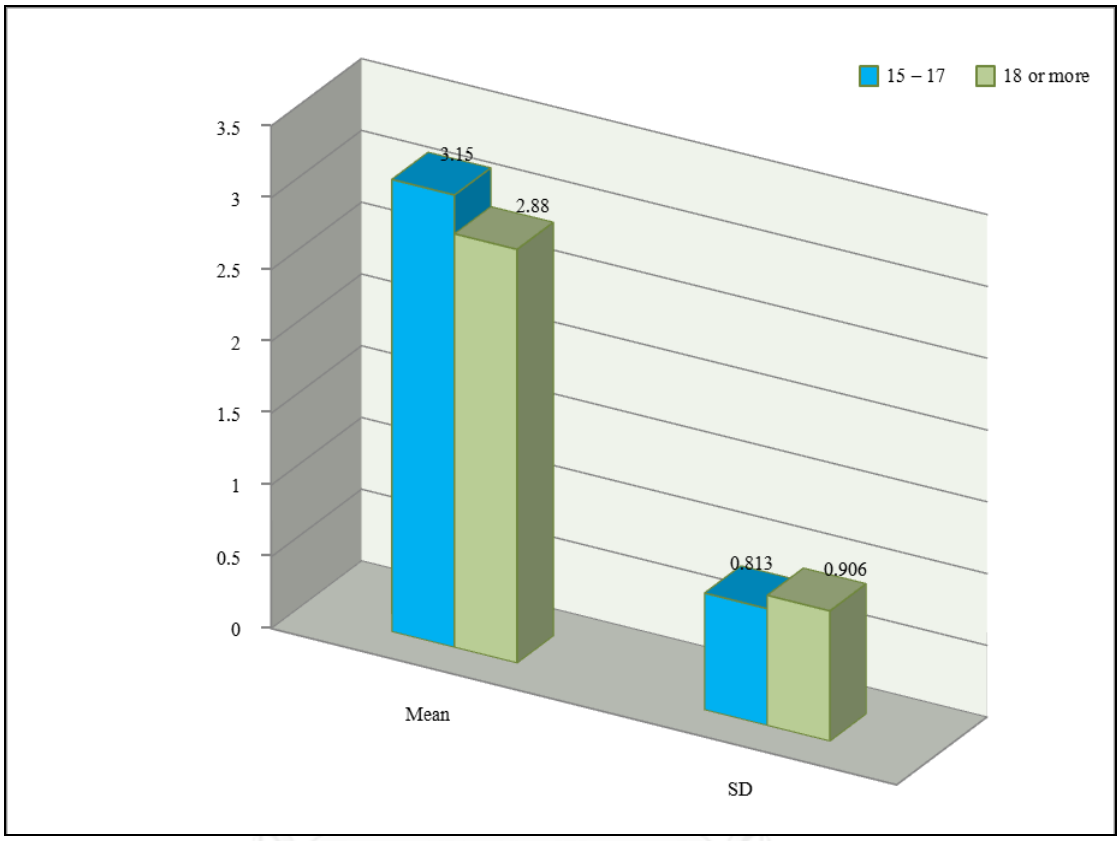


Figure 12: Mean value of CEB by age at marriage

The average of children born among women who got married after age 18 years appear smaller than those who married before 18 years (2.88 vs. 3.15) as shown in Figure 12. Apparently, those who married before 18 year have higher children than those who married after the minimum legal age. Furthermore, the study reveals that there is a negative relationship between two variables. This means that children ever born increases as age at first marriage decreases and conversely, CEB decrease as age at first marriage increases.

4.2.3 Educational Attainment

As presented in Table 7, about 34.8 percent of those with low education and 15.3 percent with primary education preferred 4 or more children. This percentage decreased sharply when compared with women who have middle secondary (1.4%), higher secondary (0.7%) and college/university (0.6%). About 5.8 percent of the respondents with lower secondary education have 4 or more children.

Table 7: Percent Distribution of Children Ever Born by Educational Attainment

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Education	[No Education]	13.8	12.4	39.1	34.8	8903
	[Primary Ed.]	28.2	16.5	40.0	15.3	1716
	[Lower Sec.]	50.9	16.5	26.8	5.8	908
	[Middle Sec.]	53.3	22.0	23.3	1.4	1397
	[Higher Sec.]	74.3	15.3	9.8	.7	767
	[College/Uni.]	53.5	26.0	19.9	.6	327
14018				**Total**		
$x^2 = 3446.364$*			**p = 0.0001**		**DF: 15**	

Furthermore, the data also reveals that the level of education in urban areas is still higher than rural areas. The percentage of women who are living in urban areas with (middle secondary, higher secondary and college/university) had higher percentages than in rural areas. This might be due to differences in educational facilities and opportunities for schooling of women in urban and rural areas. Better schooling usually is found in the urban areas. The rural is giving less importance to education as compared to urban. The age pattern of marriage might also influence the educational level of women. In rural society, women usually marry early and consequently might have missed the schooling opportunities accorded. In addition, it was found that there is a significant difference between education and CEB (chi-square value: 3446.364; df: 15; $p < 0.0001$). From the statistical analysis it has been observed that there is a negative significant relationship between the percentage of highly educated women and CEB at 0.05 significant levels. This means that increasing the percentage of highly educated women will likely decrease CEB of individual

women. Conversely, the CEB will increase whenever the percentage of highly educated women decreases. Other studies have also shown lower fertility to be associated with higher levels of education (Ashurt *et al* 1984).

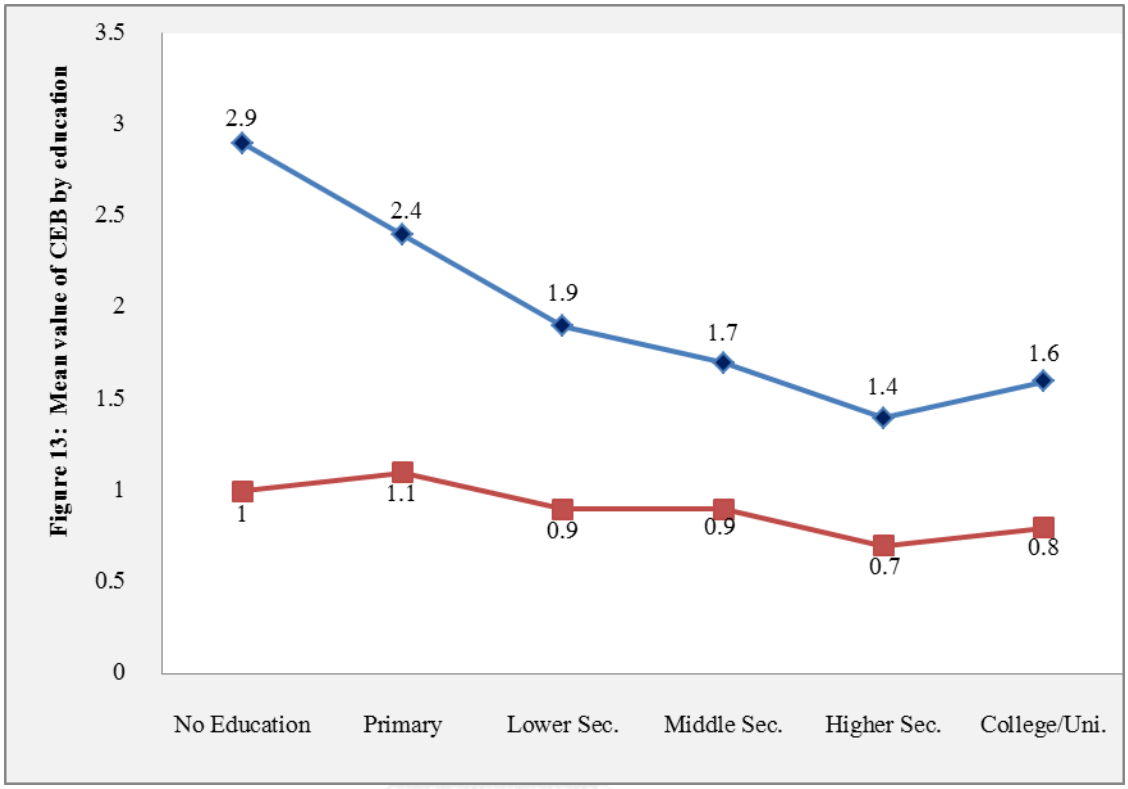


Figure 13: Mean value of CEB by Education

Furthermore, the Figure 13 also reveals that on average the level of education differs on CEB. In general findings, the average of CEB of those women with (middle secondary, higher secondary and college/university) appears smaller than women with low or no education. For instance, women in no education category are having (2.9) children ever born on average, while women with higher secondary schooling have (1.4) CEB respectively.

4.2.4 Place of Residence

Lower number of children ever born is expected in urban areas than in rural areas. Because urban women have greater exposure to modernizing forces such as, education, the mass media, and a cash economy which might encourage a small family and raise aspiration for consumer goods. They also may feel their situations are constrained by scarce housing and employment uncertainties.

Table 8: Percent Distribution of Children Ever Born by Educational Attainment

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Place of Residence	[Urban]	34.0	15.4	36.1	14.5	3487
	[Rural]	23.5	14.3	34.3	27.8	10531
Total						**14018**
$x^2 = 302.662$*			**p = 0.000**		**DF: 3**	

The Table 8 presents that about 27.8 percent of rural respondents have 4 or more children compared to 14.5 percent of the urban respondents. This indicates that in rural areas, the percentage of women having more than 4 children is higher than in the urban areas. Likewise 36.1 percent of urban respondents have 2-3 children compared to 34.3 percent of the rural respondents. The data also revealed that 15.1 percent of urban women preferred 1-child while compared to 14.3 percent of rural respondents. It was noticeable from the Table that majority of the women either in urban or rural areas have no children born (34.0% and 23.5%) respectively. Tremendously, the high percentage of women who have 2-3 children not only appears in the rural areas but also in the urban areas. Meanwhile, the analysis by chi-square statistical test revealed that there is a negative significant association between urban residence and CEB (chi-square value: 302.662; df: 3; and $p < 0.000$). This means that women who lived in urban areas are more likely to have smaller CEB than those who are living in rural areas.

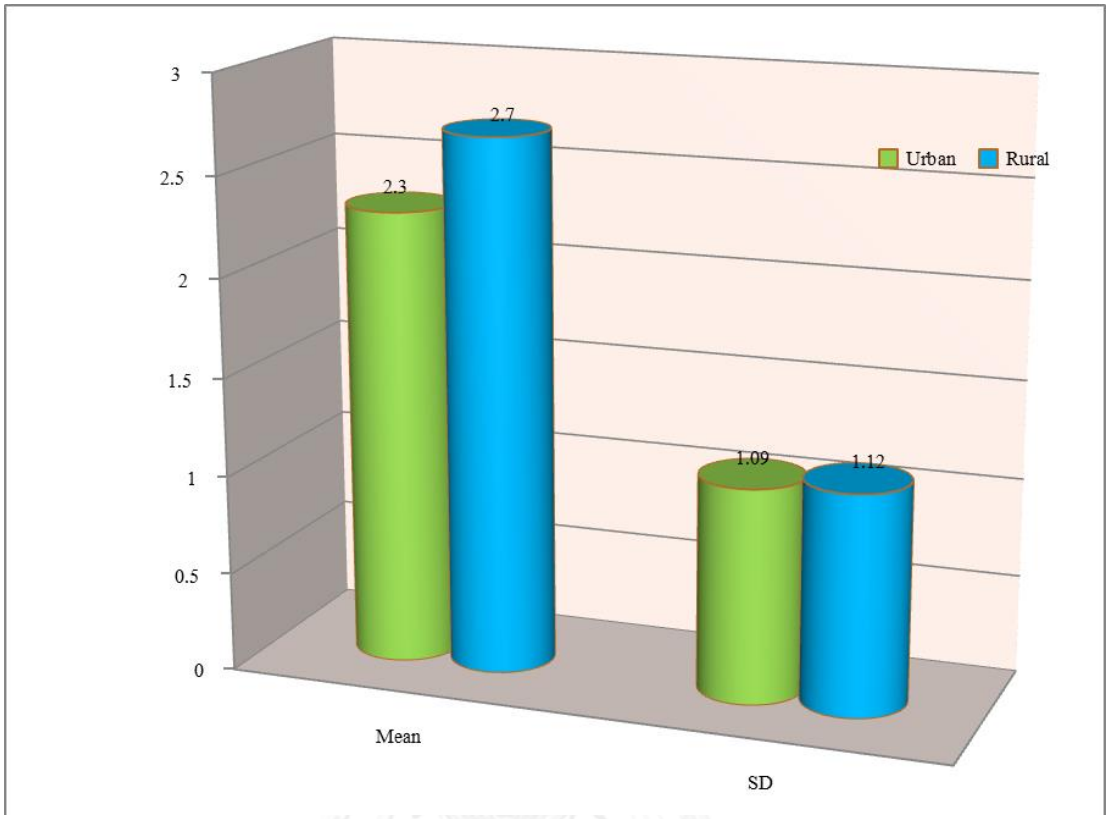


Figure 14: Mean value of CEB by residence

In addition, the Figure 14 presents that the mean number of children ever born between urban and rural areas are also different. For instance, the average of children ever born among urban women emerged smaller than rural women (2.3 vs. 2.7). This is not surprising, because in rural areas most of the people are working in the agricultural sector, which need a lot of human recourses for agricultural activities.

4.2.5 Wealth Status

Regarding the wealth status, those women having very poor and poor wealth status are (34.2% and 31%) having 4 or more children respectively. This percentage decreased sharply when compared with women being in the very rich wealth status category (12%). The finding in Table 9 also tells that women with rich wealth status (18.5%) and women with poor wealth status (31%) have 2-3 children born. Furthermore, the high percentage women who have 2-3 children not only appear with the poor or very poor wealth status but also with the women having rich or very rich wealth status.

Table 9: Percent Distribution of Children Ever Born by Wealth Status

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Wealth Status	[Very rich]	35.8	16.0	36.3	12.0	2663
	[Rich]	28.1	14.6	38.8	18.5	2876
	[Moderate]	24.6	14.5	34.2	26.7	2955
	[Poor]	22.7	13.8	32.5	31.0	2907
	[Very poor]	19.7	14.1	32.0	34.2	2617
Total						**14018**
x^2 = 555.556*			p = 0.0001		DF: 12	

Moreover, it was found that there is a significant association between wealth status and children ever born (chi-square value: 555.556; df: 12; and p < 0.0001).

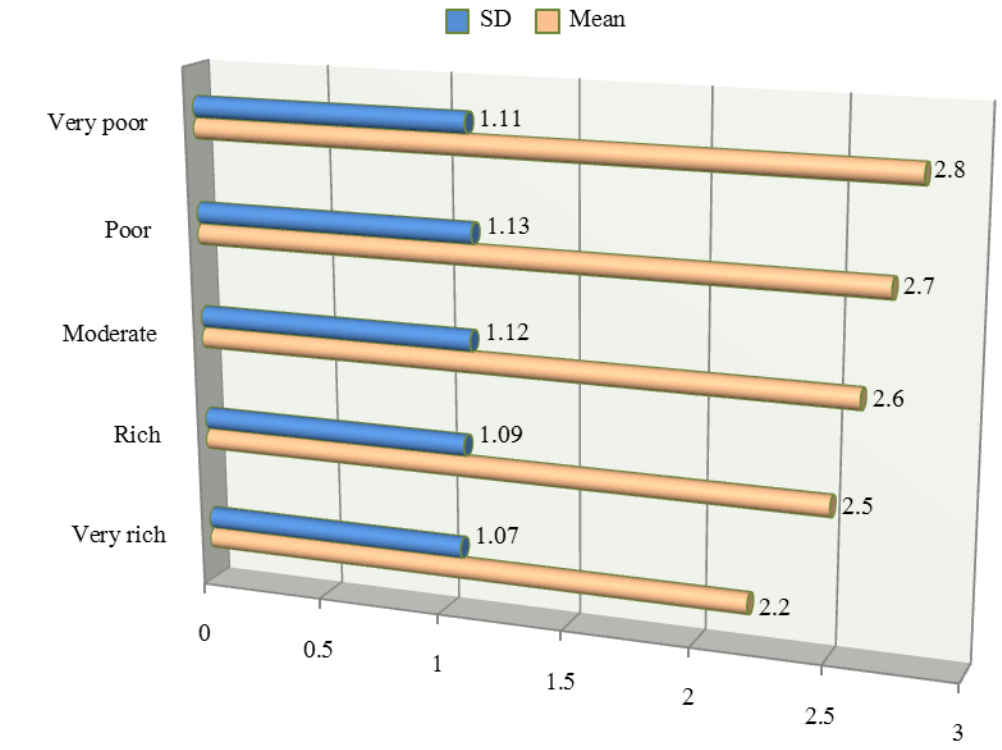


Figure 15: Mean value of CEB by wealth status

Figure 15: Mean value of CEB by wealth status

The Figure 15 discloses that the average CEB of women with very rich wealth status (2.2) appears smaller compared to those who have very poor wealth status (2.8) respectively. The mean CEB of women with moderate wealth status is 2.6. Those women with poor wealth status emerge to have greater mean number of children ever born than those respondents having rich wealth status. This denotes that women with poor wealth status are more likely to have higher children born than women having rich wealth status.

4.2.6 Child Loss

The Table 10 below illustrates, majority of women who experienced child loss have 4 or more children (74.8%) than who did not (16.1%). It was found that 26.7 percent of women who did not experience child loss have (2-3 children) and 23.4 percent who had experienced child loss. Accordingly, 1.9 percent for who had experience child loss has (1-child) and 16.7 percent who had never experienced the same.

Table 10: Percent Distribution of Children Ever Born by Child Loss

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Child Loss	[Yes]	.0	1.9	23.4	74.8	2008
	[No]	30.5	16.7	36.7	16.1	12010
Total						14018
x^2 = 3370.986*			p = 0.000		DF: 3	

In addition, it was established that there is a significant relationship between child loss and CEB (chi-square value: 3370.986; df: 3; and p < 0.000). Notably, the Figure 16 reveals that women who had a child loss experience had higher average CEB than those women who did not have such experience (3.73 vs. 2.38) respectively.

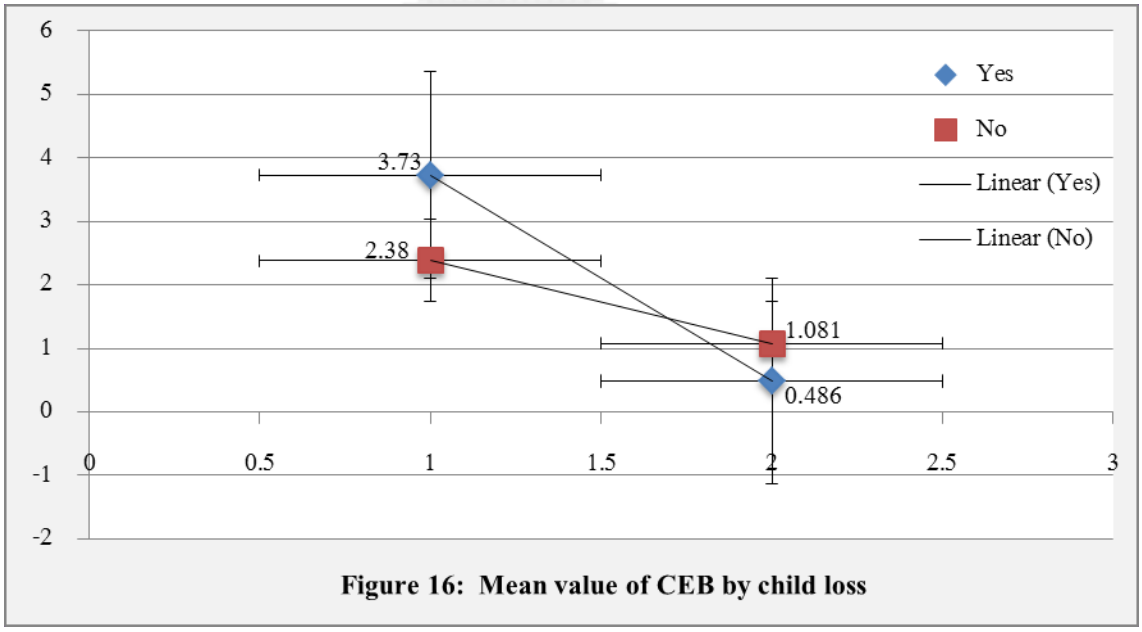


Figure 16: Mean value of CEB by child loss

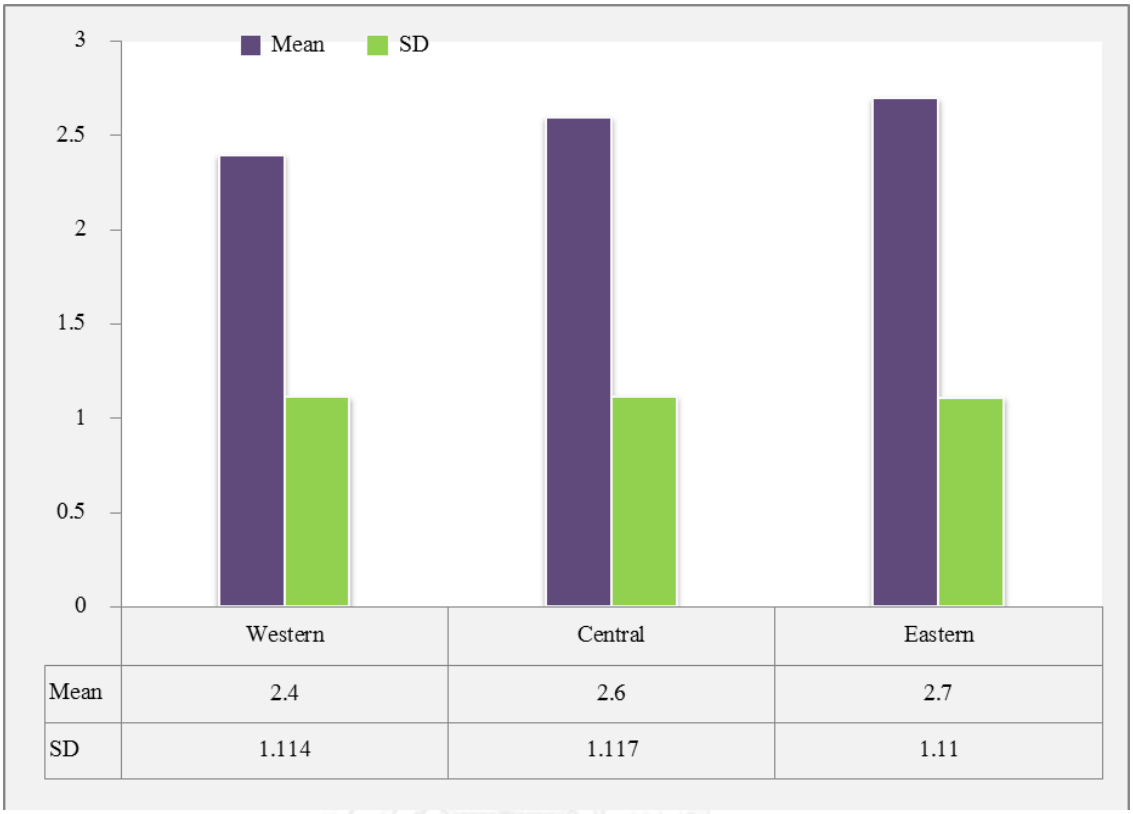
4.2.7 Region

The finding from the Table 11 indicates that about 30.7 percent of eastern region had 4 or more children compared to 25.6 percent of the central region and 18.8 percent of the western region. This is because in eastern and central regions, most of the people are working in the agricultural sector, in which, value of children are considered very high, as a wealth flow from children to their parents.

Table 11: Percent Distribution of Children Ever Born by Region

Variable		Children Ever Born in Four Groups				Number
		No children	1-child	2-3 children	4 or more	
Region	[Western]	31.0	14.3	35.9	18.8	5041
	[Central]	24.9	15.1	34.4	25.6	5181
	[Eastern]	21.3	14.2	33.8	30.7	3796
Total						**14018**
x^2 = 218.370*			**p = 0.0001**		**DF: 6**	

The analysis by chi-square statistical test in the Table 11 also denotes that there is a significant association between region of respondent and CEB (chi-square value: 218.370; df: 6; and $p < 0.0001$)..



	Western	Central	Eastern
Mean	2.4	2.6	2.7
SD	1.114	1.117	1.11

Figure 17: Mean value of CEB by region

Further, the Figure 17 shows that there are an apparent number of children ever born deferential across the three different regions of the country. The eastern region reveals slightly higher children ever born on average (2.7) than central region (2.6), followed by the western region (2.4). This means that women who lived in more developed region of the country are more likely to have smaller children ever born (CEB) than those who are living in less developed region of the country. The western is the most socio-economically developed region, representing relative modernity, whereas the eastern and central regions are the least developed as well as representing the least modern.

4.2.8 Contraceptive

Use of contraceptives is one of the most important proximate determinants of fertility. It is generally assumed that it plays the principle role in transmission to lower fertility. Thus, use of contraceptive methods may have significant impact to manage the number of children ever born. The Figure 18 confirms that majority of women (32.2%) who had never used any contraceptive methods have 4 or more children compared to women who had ever used contraceptives (7.5%). Similarly, those women who had never used (44.1%) had significantly more CEB (2-3 children)

than who had ever used (30.5%). In contrast, women who had ever used contraceptive methods (34.6%) preferred 1-child and only (16.9%) of those women who had never used any methods.

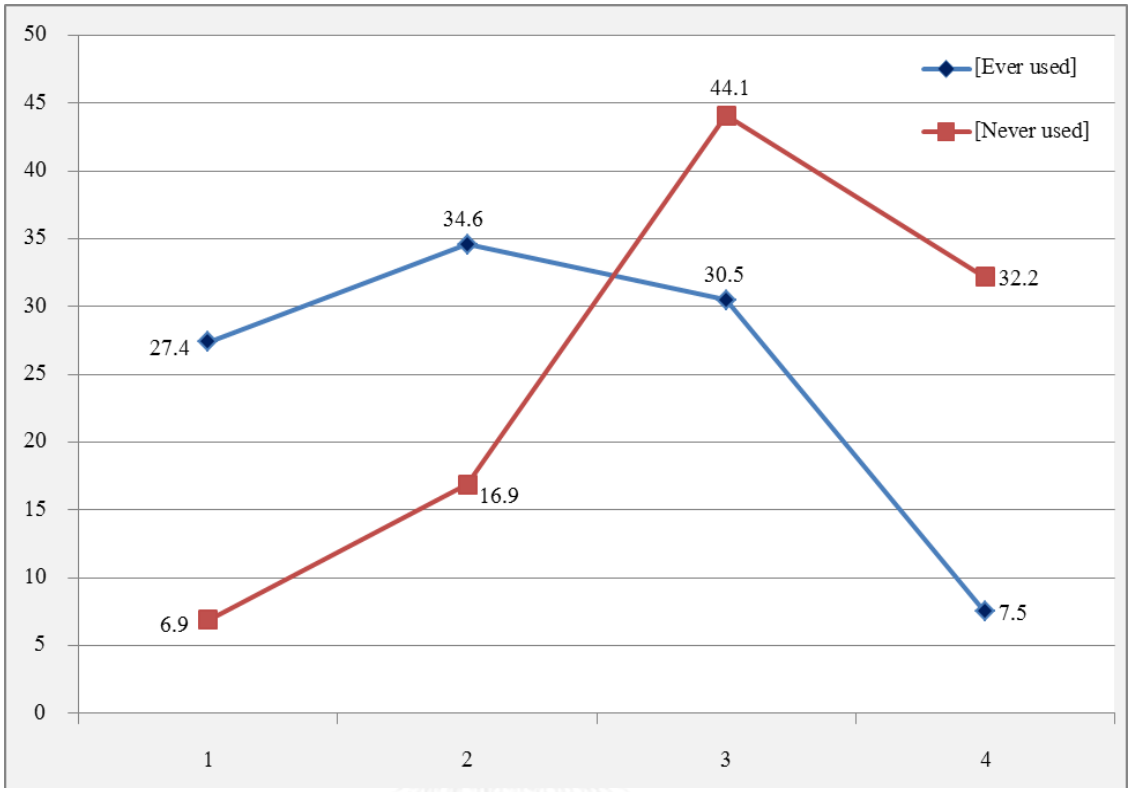


Figure 18: Percent Distribution of CEB by Contraceptives

Overwhelmingly, 27.4 percent of women who had ever used have no children and only 6.9 percent of women who had never used any contraceptive methods have no children correspondingly. The results from chi-square statistical test also revealed that there is a significant association between contraceptives used and CEB (chi-square value: 663.147; df: 3; and $p < 0.000$).

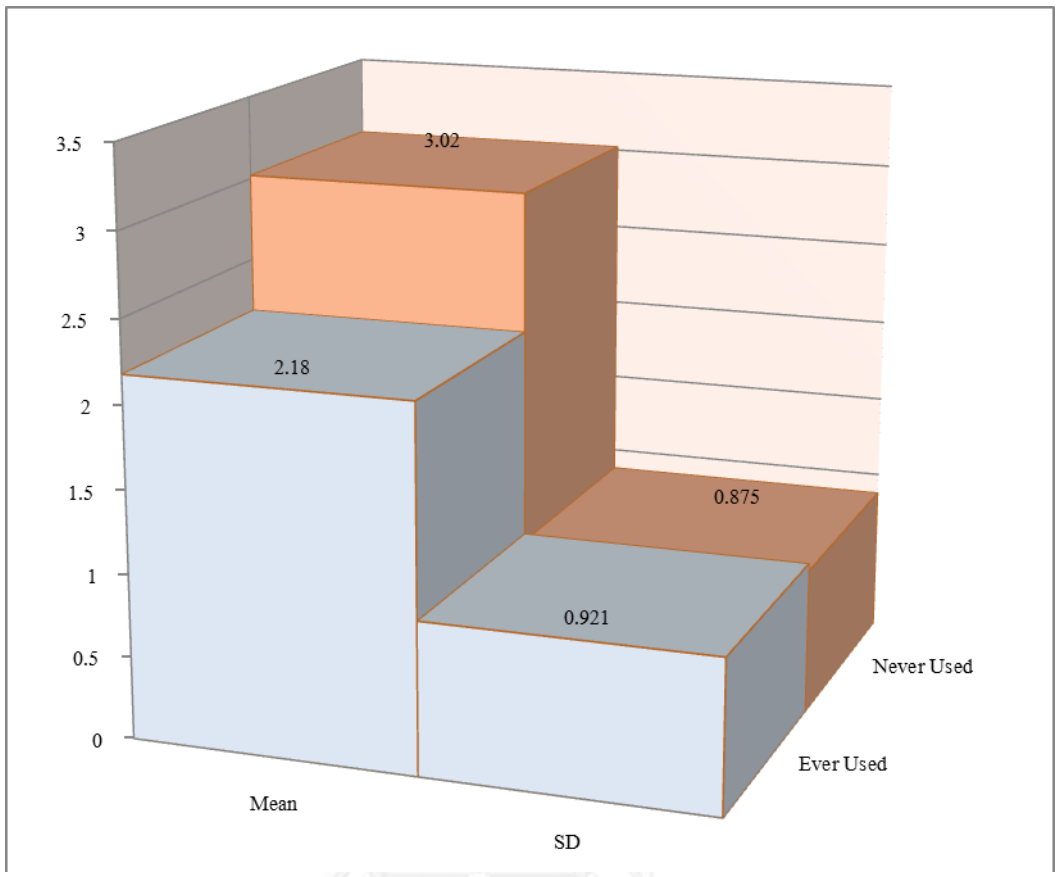


Figure 19: Mean value of CEB by contraceptives

Further, to see the relationship between the use of the contraceptives and fertility, the mean value of children ever born to those groups of women who ever used and those women who never used any methods were analyzed and presented in the Figure 19. The average of children ever born among ever used women appeared to be smaller (2.2) than women who had never used any contraceptive methods (3.0).

4.2.9 Contrast of two mean-values of CEB by age and education

The Figure 20 reveals that when age increases the mean number of CEB increase and decreases when age reduces. This means higher the age of women, more or higher the number of children born, whereas lower the age of respondent is, fewer or smaller the number of children born. Hence, age of respondent is having a positive and statistically associated with CEB.

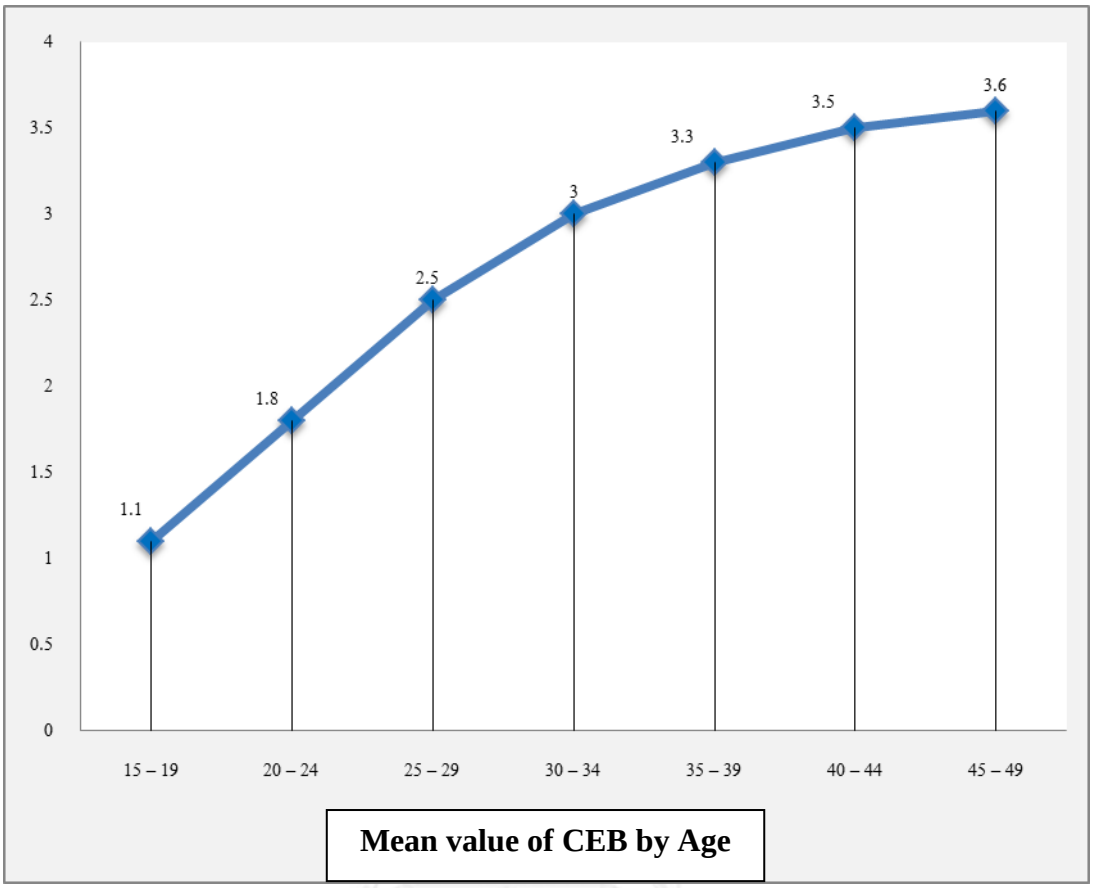
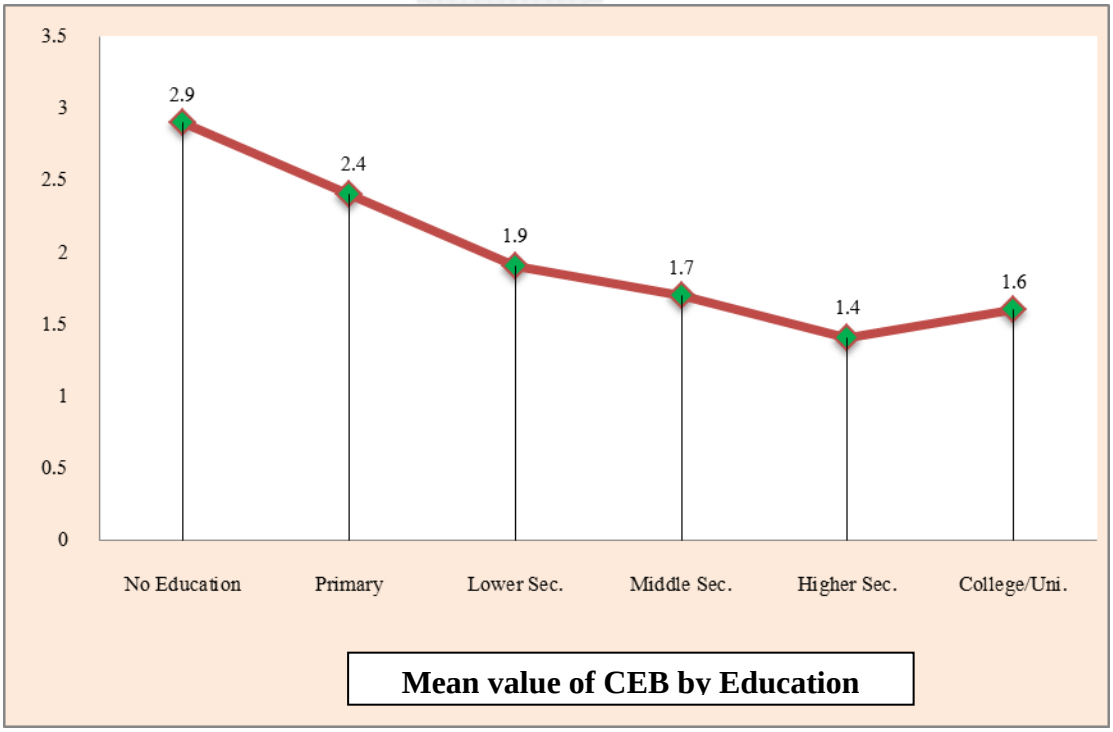


Figure 20: Comparison of two mean-values by Age and Education



In contrast, higher the education of women proved to have hypothetically smaller mean number of children ever born, whereas no or lower education proves to have higher mean number of CEB. For this reason, education is having statically a negative association with that of children ever born: a very unique of this study.

4.2.10 Mean Number of CEB by 20 Dzongkhags

The Figure 21 reveals that the lowest mean value of CEB amongst all the 20 Dzongkhags is in Thimphu followed by Paro Dzongkhag. Thimphu is a capital of Bhutan where the general hospital was located, all the offices of the ten ministries were established and new ideas on any plans and programs initially starts from Thimphu only. The same is the Paro, where only the international airport in the country was located and is very near to capital Thimphu compared to any of the other Dzongkhags. Both Thimphu and Paro are considered to be highly developed compared to other Dzongkhags in term of education, wealth status, occupation, income-generating mechanism, awareness on contraception, exposure to new ideas as well as many new options. The above mentioned two Dzongkhags was followed by Chhukha, which is located to the southern part of western Bhutan and more surprisingly all these three Dzongkhags falls under the western region. The Chhukha Dzongkhag may be having comparatively low CEB on average, because it shares the bounder with India where they get more exposures to the new ideas, earn higher income through business partnerships and moreover awareness on contraception methods. In addition, the Phuentshogling town which is considered as a second largest in term of its size and socio-economic development was also located under Chhukha Dzongkhag.

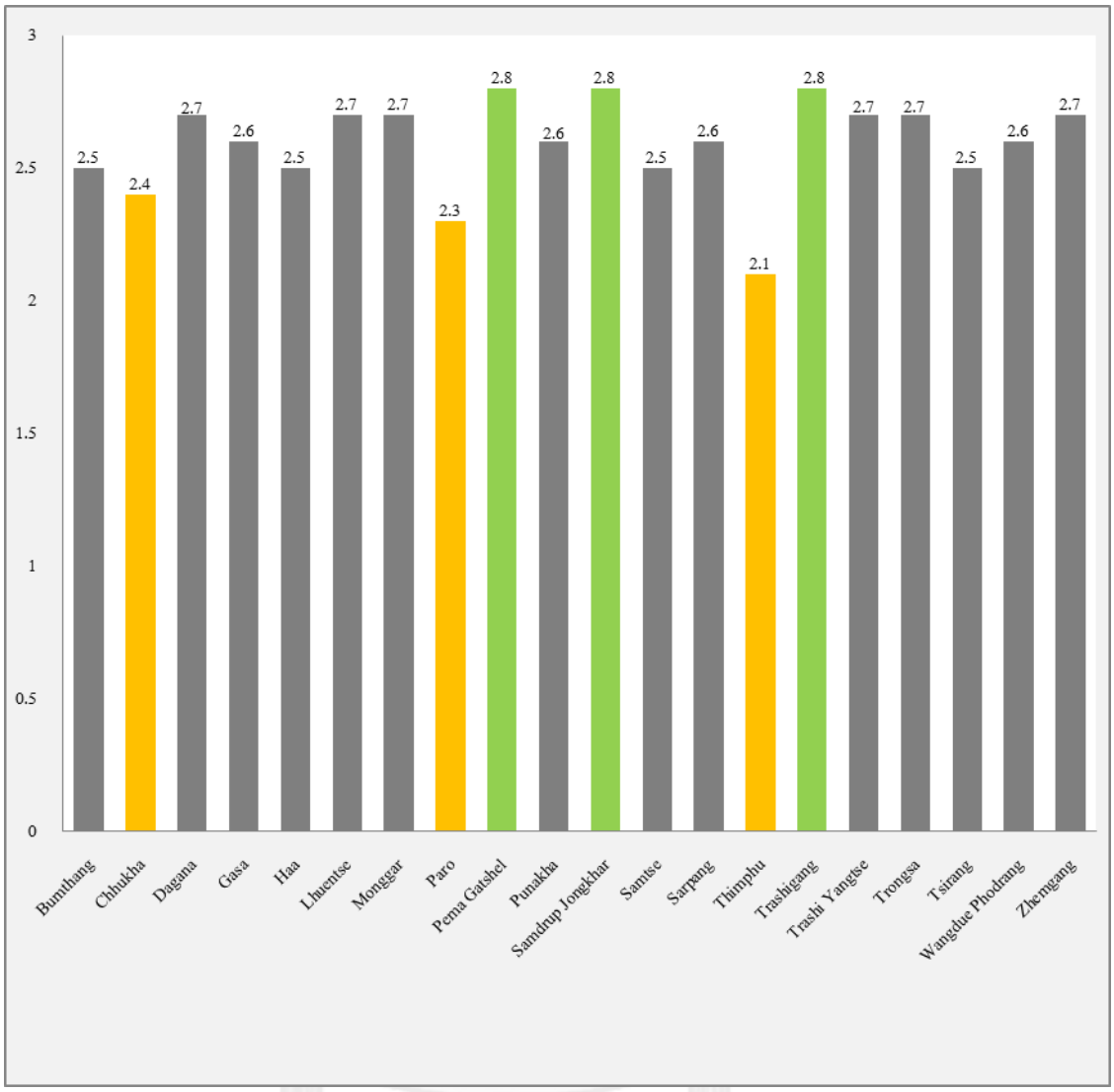


Figure 21: Mean value of CEB by 20 Dzongkhags

Whereas, Dzongkhags like Trashigang, Pema Gatshel and Samdrup Jongkhar are having the highest CEB (2.8 each) on average in Bhutan. Overwhelmingly, all these three Dzongkhags were located under eastern region. These three Dzongkhags were followed by Dagana, Lhuentse, Monggar, Trashi Yangtse, Trongsa and Zhemgang with CEB of 2.7 each on average. This indicates that these Dzongkhags were agriculturally based and less developed compared to other Dzongkhags. It was evidenced that economically the very poor, pathetic and underprivileged family backgrounds, remote and far flung corner of the realms compelled to discontinue their effort on studies and education under the aforementioned Dzongkhags. Since they are having no or low education, poor/very poor wealth status, rural residence, very less awareness on contraceptives, high child loss because of not accessible to

health facilities must have allowed and resulted them to have higher number of children ever born.

4.3 Analysis of Multivariate Regression

The multivariate analysis estimates effects of each independent variable on the dependent variable by taking into account of other independent variables simultaneously. As a result, this study examines the effect of women's status indicators and selected socio-demographic characteristic of women (individual characteristics) towards CEB using multinomial logistic regression. Furthermore, the analysis of determinants is required to examine whether variables found significant in the bivariate analysis are still significantly influencing CEB among ever married women in Bhutan. Accordingly, two models are applied in this study.

The first model contains variables: age at first marriage, education, residence, wealth status, child loss, region and contraceptives as independent variables, and CEB which is a dependent variable was further classified into three groups. The category for "more than four children" under CEB was excluded from the dependent variable in the model-1 because the age class (15 -19) years were not expected to have more than 4 children born because of their younger age. Further, it has been witnessed from the descriptive analysis of this study that women age from (15-19) have no-evidence of having four or more children born. The second model uses all the independent variables mentioned above and CEB classified into four groups as depending variables to describe the relationship, but with the consideration of age of respondent (20 years and above) only.

The results of the multinomial logistic regression are presented as relatives odds in Table 16 and Table 17 respectively. Therefore, interpretation of the independent variables is aided by the "Exp (B)" column which contains the odd ratios for each independent variable together with the p-value which is compared to a specified alpha level, our willingness to accept a type I error, which is typically set at 0.05 in this study. As a result, if the level of significance level was less than 0.05, the null hypothesis was accepted and the alternative rejected.

4.3.1 Description of the Data

This section describes results of the multinomial logistic regression including the description of the data. Firstly, consideration was given to overall test of relationship; this described the overall test of relationship. Secondly, strength of multinomial logistic regression relationship was tested; this was done to establish the

strength of multinomial regression relationship. Thirdly, evaluating for the usefulness of logistic model and determine the significance of explanatory variables.

4.3.2 Overall test of Relationship

The first thing in multinomial logistic regression analysis is to describe the overall test of association between the dependent and independent variables. The presence of a relationship between the CEB and combination of independent variables is based on the statistical significance of the final model chi-square in the Table 12; titled model fitting information. In this analysis, the distribution reveals that the probability of the model chi-square (7.0803) was 0.000, less than the level of significance of $p < 0.05$. The null hypothesis that there was no difference between the model without independent variables and the model with independent variables was rejected. As evidenced from Table 12, this suggested that the existence of a relationship between the independent variables and the dependent variable was supported, hence accepting the alternative hypothesis.

Table 12: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1.273			
Final	5.647	7.080	60	0.000

4.3.3 Strength of Multinomial Logistic Regression Relationship

Once the relationship is established, the next important thing to do is to establish the strength of multinomial logistic regression relationship. While, multinomial regression does compute correlation measures to estimate the strength of the relationship (pseudo R square measures, such as Nagelkerke's R^2), these correlation measures do not really tell an analyst much about the accuracy or errors associated with the model. A more useful measure to assess the utility of a multinomial logistic regression model was classification accuracy, which compares predicted group membership based on the logistic model to the actual, known group membership, which is the value for the dependent variable. To access the strength of multinomial logistic regression relationship, however, the evaluation of the usefulness for logistic models was considered.

In this case, using Cox and Snell R square, the Nagelkerke R square and the McFadden R square value, they provide an indication of the amount of variation in the dependent variable. These are described as pseudo R square. The distribution in Table 13 reveals that the values are 0.512, 0.563 and 0.298 accordingly; suggesting that between 51.2% percent, 56.3% percent and 29.8% percent of the variability is explained by this set of variables in the model.

Table 13: Pseudo R-Square

Step	Cox and Snell	Nagelkerke	McFadden
	0.512	0.563	0.298

4.3.4 Evaluating Usefulness for Logistic Models

The proportional by chance accuracy rate was computed by calculating the proportional of cases for each group based on the number of cases in each group in the case processing summary, and then squaring and summing the proportion of cases in each group ($0.371^2 + 0.557^2 + 0.072^2 = 0.453$). Operationally, the classification accuracy rate should be 25% or more than the proportional by chance accuracy rate. The Table 14 present that the classification accuracy rate was 63.1% which was greater than the proportional by chance accuracy criteria of 56.6% (1.25 X 45.3%). The criterion for classification accuracy is satisfied, suggesting that the model was useful.

Table 14: Classification

Observed	Predicted				
	No children	1-child	2-3 children	4 or more	% Correct
0. No children	15	346	209	42	2.5%
1. 1-child	12	747	949	76	41.9%
2. 2-3 children	2	234	3421	764	77.4%
3. 4 children or more	0	0	1006	2041	67.0%
Overall %	**.3%**	**13.5%**	**56.6%**	**29.6%**	**63.1%**

The multinomial logistic regression using a classification method for the dependent variable would provide a more satisfactory solution compared to other analysis techniques because it not only requires strict assumptions, but enables a direct interpretation of the relationship between explanatory variables and the dependent variable (Press & Wilson, 1988).

4.3.5 Relationship of Explanatory and Dependent Variables

Once the above sections are clarified, it warrants a further scrutiny of the relationship of independent and dependent variables. There are two types of tests for individual independent variables. The likelihood ratio test evaluates the overall relationship between an independent variable and dependent variables. In fact, it might or might not be statistically significant in differentiating between pairs of groups defined by the dependent variable.

Following the argument above and referring to Table 15, there is a statistically significant relationship between the independent variables and the dependent variable ($p < 0.05$). As well, the majority of the variables which showed significant associations with the CEB in the bivariate analysis could persist and continued in having such associations in the multinomial regression analysis of likely relative ratio tests. Except for the variables like place of residence and region doesn't show much significance.

Table 15: Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	5.647	.000	0	.
Age	9.058	3.411	15	0.000
Age at First Marriage	6.176	528.351	3	0.000
Education	5.893	245.999	15	0.000
Residence	5.651	4.303	3	0.231
Wealth Status	5.697	50.090	12	0.000
Child Loss	6.679	1.032	3	0.000

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Region	5.659	11.997	6	0.062
Contraceptives	5.668	20.709	3	0.000

4.3.6 Interpretation of Relative Odds Ratio

The Exp(B) columns in Table 16 and Table 17 are the odds ratio with each predictor. Indicating how the risk of the outcome falling in the comparison group compared to the risk of the outcome falling in the referent group changes with the variable in question. An odds ratio > 1 indicates that the risk of the outcome falling in the comparison group relative to the risk of the outcome falling in the referent group increases as the variable increases. In other words, the comparison outcome is more likely because the predictors which increase the logit will have Exp(B) values greater than 1. Those predictors which do not have an effect on the logit will display an Exp(B) of 1. An odds ratio < 1 indicates that the risk of the outcome falling in the comparison group relative to the risk of the outcome falling in the referent group decreases as the variable decreases, in general, if the odds ratio < 1, the outcome in more likely to be in the referent group. Meaning, the predictors which decrease the logit will have Exp(B) values less than 1.

4.3.7 Relative Odd Ratios and Significant Level at 0.05 of the Association of Socio-demographic Characteristics and CEB for Model-1

All the variables tested for bivariate effects were entered in the multivariate treatment to examine whether they have significant impacts on CEB, except the age of women from 15-19 was considered in the Model-1, while the dependent variable “more than four children” category was excluded from these model. This is because the women age 15-19 are not conventional to give birth for more than four children. From the descriptive analysis, it was noticed that women in the age group 15-19, all of them have less than four CEB. The Table 16 shows the results of multinomial logistic regression analyses of children ever born in Bhutan for model-1. It comprises the estimated relative odds ratios under the column “Exp (B)” and estimated values of the model that predict the total CEB. The significance of the odds ratios statistic (under the column labeled Sig) tells the importance of the predictor variable of the models.

Table 16: Results of the Multinomial Analysis showing Odd Ratios and Significant Level at 0.05 of the Selected Socio-demographic Factors and Age (15 – 19) of Ever-married Women on CEB

(Model-1)

Characteristics		1 – Child		2 – 3 Children	
		Exp(B)	Sig.	Exp(B)	Sig.
Age at First Marriage	[15 - 17]	1.12	0.339	1.61	0.000***
	[18 or more]®	.	.	.	.
Education	[No Ed.]	1.85	0.005**	10.22	0.000***
	[Primary Ed.]	1.94	0.005**	6.67	0.000***
	[Lower Sec.]	1.59	0.057	3.28	0.000***
	[Middle Sec.]	1.61	0.024*	2.20	0.000***
	[Higher Sec.]	0.96	0.858	0.75	0.263
	[College/Uni.]®	.	.	.	.
Residence	[Urban]	0.83	0.110	0.76	0.019**
	[Rural]®	.	.	.	.
Wealth Status	[Very rich]	1.35	0.135	4.19	0.000***
	[Rich]	1.00	0.984	1.82	0.000***
	[Moderate]	0.81	0.164	1.02	0.906
	[Poor]	0.76	0.061	0.85	0.248
	[Very poor]®	.	.	.	.
Child Loss	[Yes]	5.45	0.000***	2.88	.
	[No]®	.	.	.	.

Characteristics		1 – Child		2 – 3 Children	
		Exp(B)	Sig.	Exp(B)	Sig.
Region	[Western]	1.05	0.679	1.16	0.188
	[Central]	1.12	0.297	1.17	0.141
	[Eastern]®	.	.	.	.
Contraceptive	[Ever used]	0.73	0.008**	0.34	0.000***
	[Never used]®	.	.	.	.

a. *The reference category is: No children.*
b. *This parameter is set to zero because it is redundant*.
c. *p < 0.05 **p < 0.01 ***p < 0.001

i. 1-Child relative to No Children

From the results of the multinomial logistic regression analysis in the model-1, a number of variables, such as education, child loss and use of contraceptives were found to have a slight significant effect on CEB. Furthermore, the interpretation of the explanatory variables in the model is supported by the "Exp (B)" column which contains the odd ratios for each independent variable. The relationships are stated as follows:

Education – When we look at our independent variable, education, we can see that 'college/university' is the reference category. Compared to the college/university education, the relative risk ratio of having no education, primary and middle secondary for preferring 1-child relative to no children would be expected to increase by the factors of 1.85, 1.94 and 1.61 given that the other variables in the model are held constant.

Child loss - Compared to women with no-child loss, the relative risk ratio of women having yes-child loss for 1-child relative to no children would increase by a factor of 5.45 given that the other variables in the model are held constant. Demonstrating, women who experience child death prefers more children than women who didn't experience the child loss.

Contraceptive - Having never used contraceptives, the relative risk odds of women who ever used contraceptives for 1-child relative to no children is expected to decrease by a factor of 0.73 given that the other variables in the model are held constant. Signifying that women who never used contraceptives are having more children born than women who ever used.

ii. 2-3 Children relative to No Children

The results presented in Table 16 shows that variables such as age at first marriage, education, residence, wealth status and use of contraceptives have a significant effect on CEB. Most surprisingly, the significant of the variable "child loss" disappears and vanishes in the model. It was evidenced from the study that the variable "child loss" itself depends on the variables such as education, residence, wealth status and regions. This meant, more number of child loss occurred amongst low educated, very poor wealth status, rural and less developed region of the respondent.

Age at first marriage – This is the relative risk ratio comparing women who married at the age of (15-17) to women married at the age of (18 years and above) for 2-3 children relative to no children level given that the other variables in the model are held constant. For age (17-19) relative to 18 years and above, the relative risk for choosing 2-3 children relative to no children would be expected to increase by a factor of 1.61 given that the other variables are held constant in the model. Further, indicating that women who married at the younger ages must have given more birth to the children. Therefore, age at first marriage is one strong determinant that has significantly effect on CEB.

Education - The reference category for the variable level of education is college/university in the model. These are the relative risk ratios comparing the women having (no education, primary, lower and middle) to college/university for 2-3 children relative to no children level when the other variables in the model are held constant. For (no education, primary, lower and middle) relative to college/university, the relative risk for preferring 2-3 children relative to no children would be expected to increase by the factors of 10.22, 6.67, 3.23 and 2.20 given that the other variables are held constant in the model. It is hypothetically proved that with no or lower education means higher number of children, and negatively statistical significant.

Residence - We can interpret the relative odds ratio of residence obtained in the Table 16 using the reference category as rural. This is the relative risk ratio comparing urban to rural for 2-3 children relative to no children level when the other variables are held constant in the model. For urban relative to rural, the relative risk for choosing 2-3 children relative to no children would be expected to decrease by a factor of 0.76 given that the other variables in the model are held constant.

Wealth status - CEB also varied by wealth status. These are the relative risk ratios comparing the women having (very rich and rich) wealth status to very poor for 2-3 children relative to no children level when the other variables in the model are held constant. For (very rich and rich) relative to very poor, the relative risk for preferring 2-3 children relative to no children would increases by the factors of 4.19 and 1.82 given that the other variables are held constant in the model.

Child loss –Another variable that greatly influence the CEB is child loss. This is the relative risk ratio comparing women who experience the child loss to women who did not for 2-3 children relative to no children level given that the other variables in the model are held constant. For yes-child los relative to no-child loss, the relative risk for preferring 2-3 children relative to no children would be expected to increase by a factor of 2.89 given that the other variables in the model are held constant. Indeed, as child mortality declines, the need for high fertility lessens, and so birth rates go down (Weeks, 2005).

Region – These are the relative risk ratios comparing the (western and central) regions to eastern region for 2-3 children relative to no children level when the other variables in the model are held constant. For (western and central) relative to eastern region, the relative risk for choosing 2-3 children relative to no children are expected to have no significant differences given that the other variables are being held constant in the model.

Contraceptive - This is the relative risk ratio comparing ever use to never use for 2-3 children relative to no children level when the other variables are held constant in the model. For ever use relative to never use, the relative risk for preferring 2-3 children relative to no children are expected to decrease by a factor of 0.34 given that the other variables in the model are held constant. The study reveals that women who have not used any contraceptives are having higher CEB in the model.

4.3.8 Relative Odd Ratios and Significant Level at 0.05 of the Association of Socio-demographic Characteristics and CEB for Model-2

The Table 17 reveals the multinomial logistic regression analysis of CEB in Bhutan for Model-2. All the variables tested for bivariate effects and in the model-1 were entered in the multivariate treatment to examine whether they have significant impacts on CEB, except the age of women from (20 years and above) was considered and dependent variable CEB in four groups. This is because those women in the youngest group of 15-19 are naturally very unlikely to have four or more children. Meaning, those women of the age group 15-19 have given less than four or more births because of their younger age; therefore, we do not expect them to have more than four children. The Table 17 contains the estimated odds ratios under the column "Exp (B)" and estimated values of the model that predict the total CEB. The significance of the odds ratios statistic (under the column labeled Sig) tells the importance of the predictor variable in the model.

Table 17: Results of the Multinomial Analysis showing Odd Ratios and Significant Level at 0.05 of the Selected Socio-demographic Factors and Age (20 above) of Ever-married Women on CEB

(Model-2)

Characteristics		1 – child		2 - 3 children		4 children or more	
		Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
Age	[25 - 29]	1.78	0.000***	5.76	0.000***	36.52	0.000***
	[30 - 34]	2.10	0.000***	17.59	0.000***	367.54	0.000***
	[35 - 39]	1.84	0.000***	23.34	0.000***	1068.78	0.000***
	[40 - 44]	1.22	0.261	13.88	0.000***	1232.08	0.000***
	[45 - 49]	1.39	0.142	16.04	0.000***	1726.72	0.000***
	[20 - 24]®	.	.	.	.	.	.

Characteristics		1 – child		2 - 3 children		4 children or more	
		Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
Age at First Marriage	[15 - 17]	2.35	0.000***	8.53	0.000***	16.56	0.000***
	[18 or more]®	.	.	.	.	.	.
Education	[No Ed.]	2.11	0.001***	9.13	0.000***	75.18	0.000***
	[Primary Ed.]	2.88	0.000***	10.88	0.000***	78.02	0.000***
	[Lower Sec.]	2.53	0.001***	7.61	0.000***	43.51	0.000***
	[Middle Sec.]	2.13	0.001***	4.45	0.000***	7.62	0.012**
	[Higher Sec.]	1.12	0.646	1.44	0.188	3.69	0.147
	[College/Uni.]®	.	.	.	.	.	.
Residence	[Urban]	0.83	0.145	0.78	0.059	0.73	0.042*
	[Rural]®	.	.	.	.	.	.
Wealth Status	[Very rich]	1.06	0.804	1.51	0.067	0.75	0.258
	[Rich]	0.79	0.236	1.14	0.494	0.74	0.156
	[Moderate]	0.82	0.265	0.89	0.492	0.67	0.033*
	[Poor]	0.77	0.138	0.78	0.146	0.65	0.020*
	[Very poor]®	.	.	.	.	.	.
Child Loss	[Yes]	2.31	0.000***	1.30	0.000***	9.47	.

Characteristics		1 – child		2 - 3 children		4 children or more	
		Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
	[No]®	.	.	.	.	.	.
Region	[Western]	1.02	0.887	1.02	0.856	0.79	0.120
	[Central]	1.15	0.256	1.13	0.326	1.01	0.955
	[Eastern]®	.		.	.	.	.
Contraceptive	[Ever used]	0.86	0.251	0.55	0.000***	0.51	0.005**
	[Never used]®	.	.	.	.	.	.

a. *The reference category is: No children.*
b. *This parameter is set to zero because it is redundant.*
c. *p < 0.05 **p < 0.01 ***p < 0.001

iii. 1-Child relative to No Children

The results evidenced in accordance with the objectives and hypothesis set for the study, because a number of variables such as age of respondent, age at first marriage, education, and child loss were somehow found to have a significant impact on CEB in the model-2. Further, it demonstrates that when we add variable for age of respondent in the analysis, the result shows a strong significant association as compared to model-1. Further, in the Table 17, interpretation of the independent variables is supported by the "Exp (B)" column which contains the odd ratios for each explanatory variable. The relationships are stated as follows:

Age – This is the relative risk ratio for a one unit increase in age for 1-child relative to no children level given that the other variables in the model are held constant. If an age is increase by one unit, the relative risk for preferring 1-child relative to no children is expected to increase by the factors of 1.78, 2.10, and 1.84 given that the other variables are held constant in the model.

Age at first marriage - For the variable age at first marriage, the reference category in the model is eighteen years and above. This is the relative risk ratio comparing age (15-17) to age (18 and above) for 1-child relative to no children level when the other variables are held constant in the model. The relative risk ratio switching from the age at first marriage (18 years or more) to women age from (15-17) years would relatively choose by a factor of 2.35 times more likely for being in 1-child versus no children. In other words, the expected risk of having children is higher with women who married at younger ages as compared to women who married later.

Education - These are the relative risk ratios comparing having (no education, primary, lower and middle) to college/university for 1-child relative to no children level when the other variables in the model are held constant. For women having (no education, primary, lower and middle) relative to college/university, the relative risk for choosing1-child relative to no children are expected to increase by the factors of 2.11, 2.88, 2.53 and 2.13 given that the other variables are held constant in the model. This designates that higher learning of education makes women to postpone their age at first marriage and exposures to new ideas, etc.

Child loss – This is the relative risk ratio comparing yes-child loss to no-child loss for 1-child relative to no children level when the other variables are held constant in the model. For women who had experienced the child loss relative to those women who did not have such experience, the relative risk for 1-child relative to no children would be expected to increase by a factor of 2.31 given that the other variables in the model are being held constant.

iv. 2-3 Children relative to No Children

A number of variables such as age, age at first marriage, education, child loss and use of contraceptives were found to have statistically significant effect on the dependent variable in the model-2.

Age – This is the odds or “relative risk” ratio for a one unit increase in age for 2-3 children relative to no children level given that the other variables in the model are held constant. If a subject where to increase her age by one unit, the relative risk for preferring 2-3 children relative to no children would be expected to increase in the model when the other variables are held constant.

Age at first marriage – This is the relative risk ratio comparing the women whose age at first marriage was below eighteen years to women whose age at first marriage is eighteen years and above for 2-3 children relative to no children level given that the other variables in the model is held constant. For age (17-19) relative to age (18 and above), the relative risk for choosing 2-3 children relative to no children would be expected to increase by a factor of 8.53 when other variables are held constant in the model. Bongaarts stated that it was one of the determinants, which had the greatest effect on CEB (Bongaarts 1982: 180).

Education – These are the relative risk ratio comparing having (no education, primary, lower and middle) to college/university for 2-3 children relative to no children level given that the other variables are held constant in the model. For (no education, primary, lower secondary and middle secondary) relative to college/university, the relative risk for preferring 2-3 children relative to no children would be expected to increase by the factors of 9.13, 10.88, 6.71 and 4.45 when the other variables in the model are held constant. The reduced odds ratio with the increased in educational level of women implies that higher the level of education that women has accomplished, would results into smaller number of CEB.

Child loss - This is the relative risk ratio comparing yes-child loss to no-child loss for 2-3 children relative to no children level when other variables are held constant in the model. For yes-child loss relative to no-child loss, the relative risk for 2-3 children relative to no children would be expected to increase by a factor of 1.30 given that the other variables in the model are held constant.

Region – These are the relative risk ratios comparing (western & central) regions to eastern region for 2-3 children relative to no children level when the other variables in the model are held constant. For (western & central) relative to eastern region, the relative risk for preferring 2-3 children relative to no children would be expected to have no significant differences given that the other variables are held constant in the model.

Contraceptive – This is the relative risk ratio comparing ever use to never use for 2-3 children relative to no children level given that the other variables are held constant in the model. For ever use relative to never use, the relative risk for choosing 2-3 children relative to no children would be expected to decrease by a factor of 0.55 when the other variables in the model are held constant.

v. 4-Children or more relative to No Children

A number of variables such as age, age at first marriage, education, residence, wealth status, and use of contraceptives were found to have statistically significant effect on CEB in the model-2. Overwhelmingly, the significant of the variable "child loss" disappears and vanishes in the model. It was evidenced from the study that the variable "child loss" itself depends on the variables such as education, residence, wealth status and regions. This meant, higher number of child loss must have occurred amongst low educated, very poor wealth status, rural and less developed region of the respondent as reflected in the model.

Age - For the variable age of respondent, the age group (20-24) is the reference category in model-2. Each other category is compared to this reference category in terms of their probability of being categorized 4 or more children, as predicted by the model. This is the relative risk ratio for a one unit increase in age for 4 or more children relative to no children level given that the other variables in the model are held constant. So, given a one unit increase in other age categories, the relative risk of being in the 4 or more children category relative to no children is comparatively expected to be increased when the other variables are held constant in the model. For instance, the drastic increased in the relative risk odds with increases in age of women demonstrate the higher number of children born whenever there is an increase in the age of respondent. In the descriptive analysis, it has been perceived that those women in the age class 20-24, all of them have rare or less than four children born.

Age at first marriage - For the variable age at first marriage, the reference category is eighteen years and above. This is the relative risk ratio comparing women with age at first marriage below eighteen years to women with age at first marriage eighteen years and above for 4 children or more relative to no children level when the other variables in the model are held constant. For age (15-17) relative to age (18 and above), the relative risk for preferring 4 or more children relative to no children would increase by a factor of 16.56 given that the other variables are held constant in the model. Meanwhile, both age at first marriage and level of education of ever-married women in Bhutan are found statistically significant in bivariate-analysis as well as in the multivariate analysis.

Education - The reference category for the variable level of education is college/university education as presented in the Table 17. These are the relative risk

ratios comparing (no education, primary, lower and middle) to college/university education for 4 children or more relative to no children level when the other variables in the model are held constant. For (no education, primary, lower and middle) relative to college/university, the relative risk for choosing 4 or more children relative to no children would be expected to increase dramatically. For higher secondary relative to college/university education, the relative risk for preferring 4 or more children relative to no children would be expected to have no significant differences given that the other variables are held constant in the model. Remarkably, the relative odds of women to have 4 children or more keep on decreasing considerably when the education of women increases. This proves that higher the level of education for women means lower the CEB, whereas, no or low level of education for women means higher the CEB. In general, if the relative odds ratio < 1, the outcome is more likely to be in the referent group. Many literatures support that higher education of women can delay marriage, since they spent more time studying and they are more likely to worm after that (Mason 1989; Mahadevan & Sumangala 1987; Vanden Heuvel & McDonald, 1994).

Residence – This is the relative risk ratio comparing urban to rural for 4 children or more relative to no children level given that the other variables in the model are held constant. For urban relative to rural, the relative risk for preferring 4 children or more relative to no children would decrease by a factor of 0.73 when the other variables are held constant in the model. This is because the urban gives more importance to education than rural, which opens their minds to new ideas, information and most importantly on the use of contraception.

Wealth status - Another variable that greatly influence the CEB is the wealth status of the women in model. These are the relative risk ratios comparing (moderate and poor) to very poor wealth status for 4 children or more relative to no children level when other variables in the model are held constant. For moderate and poor relative to very poor, the relative risk for 4 children or more relative to no children is expected to be decreased by the factors of 0.67 and 0.65 given that the other variables in the model are held constant. In fact, being moderate and poor increased the likelihood that a woman would choose less likely to have four or more children relatively compared to women having very poor wealth status. The decline in the relative odd ratios as wealth status of the women increase is probably a reflection of the fact that higher CEB is associated with being poor.

Child loss – This is the relative risk ratio comparing yes-child loss to no-child loss for 4 children or more relative to no children level when the other variables are held constant in the model. For yes-child loss relative to no-child loss, the relative risk for choosing 4 children or more relative to no children is expected to increase by a factor of 9.47 given that the other variables in the model are held constant. A study conducted by Frankenberg (1999) in Indonesia found that child loss had a greater impact on fertility level in the country. Thus, this probably explains the predictability associations between child loss and higher CEB in Bhutan.

Region – These are the relative risk ratios comparing (western and central) to eastern region for 4 children or more relative to no children level given that the other variables in the model are held constant. For women residing in western and central regions relative to eastern, the relative risk for preferring 4 or more children relative to no children is expected to be almost the same (no significant difference) when the other variable are held constant in the model.

Contraceptive – This is the relative risk ratio comparing ever use to never use for 4 children or more relative to no children level given that the other variables are held constant in the model. For ever use relative to never use, the relative risk for choosing 4 children or more relative to no children would decrease by a factor of 0.514 given that the other variables in the model are held constant.

4.3.9 Women's Status Predictors in the Model-1 Predicting CEB

Model-1 in Table 16 shows that, all socio-demographic characteristics of women, with the exception of region of respondent are statistically significant predictors of children ever born. The standardized relative odds ratios indicate the relative importance of predictors, it is observed that the contraceptives is the best predictor of CEB followed by age at first marriage and women having no or primary education. Meanwhile, region is clearly not an important predictor. From the same table, the CEB of women increases when the age of women at first marriage decreases. In the meantime, the study suggest that CEB will decrease when a women has higher education, high wealth status, and those living in the urban areas.

4.3.10 Women's Status Predictors in the Model-2 Predicting CEB

When the variables age of women from (20 years and above) is added into model-2, the regression odds ratios changed. This means that adding variable in the model changes the baseline relationships of predictors with CEB and improves the

relative odds ratios of variation in CEB. Compared with model-1, the best predictor of CEB in the model-2 is estimated odds ratios of age of women, followed by age at first marriage, level of education of women, wealth status, residence and use of contraceptives. This means that in this model, these variables are important in affecting children ever born.

Based on these important predictors, the odds ratios of CEB will decreases sharply for every-increases in the level of education of women holding others variables in the model constant. CEB also decreases with the increases in the wealth status of women; urban residence and use of contraceptives also reveals low CEB in the model provided that the other variables are held constant. Table 17 also reveals that, most of the individual variables with the exception age of women have the same direction as in the bivariate relationships. Most of the variables exhibited a negative effect on children ever born, but for age of women exhibited a positive effect.

Overall, the multinomial logistic regression models provided sufficient evidence on how women's status and its empowerment in terms of education, residence, wealth status, use of contraception, etc. are related to the total number of children ever born (CEB).

Chapter V

DISCUSSION, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Discussion and Conclusion

The status of women is attributed and plays an important role on fertility behavior in Bhutan. As a result, the main objectives of this study are to identify individual level determinants of CEB, to identify status of women indicators that has a significant impact on fertility and to determine the relationship between women's status indicators and fertility for selected individual characteristics of socio-demographic characteristics of women in reproductive age such as age of women, age at first marriage, education, residence, wealth status, child loss, region and use of contraceptives.

Data from the Bhutan Multiple Indicators Survey (BMIS) conducted in 2010 by the National Statistical Bureau (NSB) was used for the analysis. Some information about socio-demographic characteristics of women and fertility on CEB was collected during the survey. It is important to point out that this survey was not designed to assess the status of Bhutanese women. Therefore, the study has been carried out with limited variables related to women's status. A total of 16,823 women in reproductive age (15-49) were chosen from the main sample in the BMIS as the sample respondents of this study. Of these, 14,018 women in reproductive age were successfully interviewed. For these purposes, various methods of analysis and different techniques such as descriptive statistics, bivariate and multinomial regression were performed to witness the relationship about the most important explanatory variables in explaining quantitative responses on CEB. The results obtained are discussed as mentioned hereunder.

In the analysis, the probability of the model chi-square (7.0803) was 0.000, less than the level of significance of 0.05. Suggesting and supporting an existence of statistically significant association between the independent variables and dependent variable.

The age of women is an important variable that can affect total CEB and found to have significantly positive relationship. Women whose age is 15-19 and 20-29 are less likely to have four children or more than women whose age is 40-49. A similar study also shows as the age increases, the risk of exposure to pregnancy and childbearing also increases, because of higher probability of getting sexual relation and marriage (Tewodros Alemayehu, 2010).

Age at first marriage is another important variable affecting total CEB. A negative significant relationship was found between age at marriage and CEB. This study shows that women married before reaching 18 years of age are more likely to have more children in their life time in comparison with women married after eighteen years. Generally, women who marry young will have had a longer duration of marriage and have born more children, so their CEB will tend to be higher (Kent and Larson, 1982). (Ramesh Adhikari., 2010) shows that older age at first marriage play an important role in minimizing fertility. Higher age at first marriage has an adverse effect on high fertility. Early marriage not only makes a women's entry into a sexual union and the beginning of exposure to childbearing but may also be an important measurement of women's status, since the higher the age of a woman at first marriage, the greater the likelihood that she attends school or gets employed, and the greater her chances of having a more equal relationship with her husband.

Education is acknowledged the most effective way of improving women's status and plays leading roles in fertility transition. Education also influences women empowerment. As a result, the study also found that total CEB is significantly highest among women having no education and second highest to women having primary education as compared to those women holding higher secondary or college education. This result is consistent with previous reports (United Nations 1995; Jejeebhoy 1995). Education may influence fertility by changing the belief and norms of tradition for large family size because education exposes women to new ideas, information, empowers women, aspirations for higher level of living and greater interest in events occurring outside the home for more educated women, and makes them more aware of their own health and the health of their children. Educated women are more likely to postpone marriage and childbearing because of several years devoted to attaining a higher education. Education may increase use of contraception to delay childbearing within the marriage circuit than are uneducated women (Ramesh Adhikari., 2010) which in turn is more conducive to limiting their number of children. Furthermore, the analysis shows that the educational level of respondent is one of the major factors influencing the CEB in Bhutan. This indicates that raising the level of education is one effective strategy of promoting to limit the number of children born, particularly in the rural areas, women with no or low education, women having very poor wealth status, and women residing in less developed regions. Moreover, educated women may have greater decision making power on health related matters and also attach higher value to the welfare and their health. Further, educated mothers will have more confidence in handling the

officials working in the health care centre and have the ability and willingness to travel outside the home to seek services which enable them to open the mind-sets to use more contraceptive methods available.

In regards to residence, the study reveals that residential differences had a significant impact on total CEB. Women who lived in urban areas are more likely to have fewer children than women in rural areas. This finding corresponds with the result of a study in Nepal by (Sharma S., 1998) where they show that rural women desire to have more children than urban women. The difference in choosing for additional children among rural and urban women could be due to the parent's perceived costs and benefits of children. Rural women perceive greater benefit from children and see lots of advantages in having large families. They also anticipate support from their children in old age. The rural-urban differentials on CEB could be related to the differences in the accessibility of health care facilities and less knowledge on contraceptive measures including the distance one has to cover to the heath care centre. Moreover, rural women in Bhutan are more readily influenced by traditional beliefs and practices that are contrary to modern health care. On the other hand, women who are living in the urban areas have greater exposure to modernizing forces, such as education, media, and a cash economy which might encourage small families and also raise aspirations for consumer goods. They also feel their situations are constrained by scarce housing and employment uncertainties (Kent and Larson, 1982).

A study by (Abdul Hakim., 1994) shows that fertility is lower in urban areas than in rural areas due to the impact of a host of factors. The lower fertility in urban areas may be viewed from two perspectives. Firstly, at the aggregate (macro) level of analysis, urban fertility may be lower because the urban population has a larger proportion of collar jobs and who are thus likely to marry late and have smaller families. Secondly, at the individual (micro) level of analysis, one may hypothesize that the same level of education and wealth status will produce lower fertility in urban setting. Moreover, the urban population has a higher proportion of those who are expected to adopt new ideas and new life styles first because of higher level of educational attainment and moreover urban areas are well served with medical and health facilities.

Another important finding of the study is the observation that the CEB is influenced by economic factors. In particular, this study demonstrates that the wealth status of women is another important variable affecting total CEB. It shows

that women who have higher wealth status (very rich/rich) are less likely to have four or more children than women having low wealth status (poor/very poor). Our findings are consistent with studies conducted in other countries and confirm the importance of women's economic empowerment. Lunching income generation program especially to female with low status would be beneficial to community because it may help to balance fertility behavior with that of women in higher status, as fertility is inversely related with wealth status.

Notably, there is statistically significant association between child loss and children ever born. Child loss was high in the study. This is due to majority of respondent in Bhutan are residing in the rural areas. Higher trend of child loss is also due to persistent habit of home delivery trend. It can be concluded that people in rural areas are firstly, not having good accessibility to health facilities, secondly, not aware on health issues and thirdly, lack of seriousness regarding the female delivery case. To what extent, child loss factor had the greatest effect on fertility compared to other proximate determinants. The government or policy makers should draw attention to this issue because the study showed that the impact of child loss on fertility in Bhutan is statistically significant.

Further, the study shows that there are an apparent number of children ever born deferential across the three major regions of the country. The eastern region reveals higher CEB on average, followed by the central region than western region. This means that women who lived in more developed region of the country are more likely to have smaller children born than those who are living in the less developed region.

The uses of contraceptive methods are found to be a significant variable for total CEB. Women who never used contraceptives are more likely to have four or more children, indicating a positive association with CEB. The study by Ramesh (2010) shows that women who had ever used contraception had low number of children born than those who did not used any contraception. This may be because women who use contraceptives visit the antenatal clinics regularly for re-supply of contraception. It is possible that during these visits, these women are exposed to health education and counseling which is likely to increase their utilization of maternal and child health services, including delivery in a health facility and assisted by a skilled attendant.

5.2 Recommendations

Based on the findings of the current study, the following specific policies were recommended:

- Programs may target on young women, particularly those with no or little education and residing in rural areas, with information on reproductive health and to provide them with basic life skills to enable them to avoid early sexual activity and untimely early marriage. Therefore, government may implement a range of strategies in order to encourage marriage at a later age, and such approach adopted should focus on the effort to increase educational achievement on women, as it has been evidenced from this study that education empowers women compared to women with relatively less or no education.

- Education is a key element for improving the status of women. Measures to improve women's education may be taken into account by government and policy makers to empower the women, so that their opinion may carry greater weight in considerations about quality and number of children born.

- The government may seek ways to empower economically by producing income-generating schemes and increasing wealth status. Women's economic independent should be promoted.

- Child loss compels women to reproduce more children as a concept of replacement for their dead children, especially happening amongst women having low status. Therefore, it is necessary to conduct health related program to control child loss and create awareness among those women with low status- who are residing in rural areas, less developed regions, low wealth status and among women having no or low education.

- More emphasis may be given to the less developed regions in terms of education, income generations and creation of more awareness on use of contraception, as this is important avenue for empowering women so as to enhance their active participation in market economy as well.

- Awareness creation on the use of contraceptive methods may be done without consideration of boundaries of region. It is something that must be done at balanced development. Knowledge plays an immense role in using contraceptives. When women become aware of contraceptive methods, the chance of using them will be higher. So, knowledge and awareness dissemination helps to increase the motivation of using contraceptive methods. Therefore, policy makers would need to improve the various information, education and communication program in order to dissipate the knowledge about the use of contraception.

- A special emphasis may be put on encouraging women in the use of contraceptives. Different types of programs and awareness campaign including integrated counseling and follow up techniques may be thought of and organized to increase knowledge of available options and access, while interpersonal communication should be considered at the local level to induce transforming in contraceptive use. As well as, increase training for the health providers in the field to increase their ability to give better services in the community.

- Overall, there is need to improve and raise the status of women in Bhutan in terms of education and socio-economic status. It is equally important to encourage women to take up activities to enhance their skills to improve their livelihoods.

- Women in Bhutan have less job skills, low business knowledge and less work experience, which further makes them vulnerable and prone to low status as well as less empowered than men.

- With the strengthening of co-ordination, collaboration and co-operation among various non-government agencies; sensitizing gender issues to planners, policy makers, local government officials and parliamentarians, and also the office such as national commission for women and children (NCWC) may specifically encourage women in the rural or in the vulnerable groups to participate in the developmental economic activities in order to gain and improve their status.

- Hence, policy makers may give a thought and implement various methods and techniques on how equipping women with different skills can enhance and make it as one of the important pillars in contributing to the empowerment of women's status in the country.

- Lastly, Bhutan has experienced a remarkable decline in fertility. The total fertility rate (TFR) of around 5.6 children per women in 1994 was dropped by more than half to 2.6 in 2005. Therefore, policy makers may need to give a detail thought that such demographic dynamic (declining fertility) below replacement level have engendered issues that are emerging as major concerns at present in many developed countries around the world, are the final recommendations of this study among others.

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APPENDICES

LIST OF TABLES ON MULTINOMIAL LOGISTIC REGRESSION

Appendix A : Multinomial Analysis of Selected Socio-demographic Characteristics and Age (15 – 19) of Ever-married Women on CEB

Children Ever Born		B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1-child	Intercept	.453	.251	3.255	1	.071			
	[15 - 17]	.110	.114	.916	1	.339	1.116	.892	1.396
	[18 or more] ®	0[b]	.	.	0	.	.	.	.
	[No Education]	.613	.217	7.967	1	.005	1.846	1.206	2.824
	[Primary Ed.]	.662	.236	7.886	1	.005	1.938	1.221	3.075
	[Lower Sec.]	.468	.246	3.618	1	.057	1.597	.986	2.586
	[Middle Sec.]	.477	.211	5.104	1	.024	1.612	1.065	2.438
	[Higher Sec.]	-.041	.231	.032	1	.858	.959	.610	1.509
	[College/Uni.]®	0[b]	.	.	0	.	.	.	.
	[Urban]	-.191	.120	2.549	1	.110	.826	.653	1.045
	[Rural]®	0[b]	.	.	0	.	.	.	.
	[Very rich]	.302	.202	2.229	1	.135	1.352	.910	2.010
	[Rich]	.003	.169	.000	1	.984	1.003	.721	1.396
	[Moderate]	-.210	.151	1.934	1	.164	.811	.603	1.090
	[Poor]	-.280	.149	3.519	1	.061	.756	.564	1.013
	[Very poor]®	0[b]	.	.	0	.	.	.	.

Children Ever Born	B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
[Yes- child loss]	17.81	.181	9679.0	1	.000	5.448	3.821	7.769
[No- child loss]®	0[b]	.	.	0	.	.	.	.
[Western]	.048	.116	.171	1	.679	1.049	.836	1.316
[Central]	.115	.110	1.087	1	.297	1.122	.904	1.392
[Eastern]®	0[b]	.	.	0	.	.	.	.
[Ever used]	-.320	.121	7.006	1	.008	.726	.573	.920
[Never used]®	0[b]	.	.	0	.	.	.	.

a. The reference category is: No children.

b. This parameter is set to zero because it is redundant.

Appendix B: Multinomial Analysis of Selected Socio-demographic Characteristics and Age (15 – 19) of Ever-married Women on CEB

Children Ever Born		B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
2-3 children	Intercept	-.587	.257	5.21	1	.022			
	[15 - 17]	.478	.106	20.38	1	.000	1.613	1.311	1.984
	[18 or more] ®	0[b]	.	.	0	.	.	.	.
	[No Education]	2.32	.227	104.3	1	.000	10.21	6.541	15.953
	[Primary Ed.]	1.89	.243	60.82	1	.000	6.666	4.138	10.738
	[Lower Sec.]	1.18	.254	21.80	1	.000	3.279	1.992	5.397
	[Middle Sec.]	.789	.226	12.21	1	.000	2.201	1.414	3.425
	[Higher Sec.]	-.287	.257	1.251	1	.263	.750	.453	1.241
	[College/Uni.] ®	0[b]	.	.	0	.	.	.	.
	[Urban]	-.271	.115	5.541	1	.019	.763	.609	.956
	[Rural]®	0[b]	.	.	0	.	.	.	.
	[Very rich]	1.43	.194	54.60	1	.000	4.196	2.868	6.137
	[Rich]	.599	.159	14.14	1	.000	1.821	1.333	2.489
	[Moderate]	.017	.142	.014	1	.906	1.017	.770	1.343
	[Poor]	-.162	.140	1.33	1	.248	.851	.646	1.119
	[Very poor]®	0[b]	.	.	0	.	.	.	.

Children Ever Born	B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
[Yes- child loss]	19.47	.000	.	1	.	2.883	2.883	2.883
[No- child loss]®	0[b]	.	.	0	.	.	.	.
[Western]	.144	.109	1.73	1	.188	1.155	.932	1.431
[Central]	.154	.104	2.17	1	.141	1.166	.950	1.431
[Eastern]®	0[b]	.	.	0	.	.	.	.
[Ever used]	-1.08	.127	73.96	1	.000	.337	.263	.432
[Never used]®	0[b]	.	.	0	.	.	.	.

a. The reference category is: No children.

b. This parameter is set to zero because it is redundant.

Appendix C: Multinomial Analysis of Selected Socio-demographic Characteristics and Age (20 years and above) of Ever-married Women on CEB

Children Ever Born		B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1-Child	Intercept	.216	.275	.614	1	.433			
	[25 - 29]	.574	.077	56.06	1	.000	1.775	1.528	2.063
	[30 - 34]	.742	.116	41.24	1	.000	2.100	1.674	2.633
	[35 - 39]	.612	.161	14.35	1	.000	1.843	1.343	2.529
	[40 - 44]	.197	.175	1.26	1	.261	1.218	.864	1.718
	[45 - 49]	.332	.226	2.16	1	.142	1.394	.895	2.169
	[20 - 24] ®	0[b]	.	.	0	.	.	.	.
	[15 - 17]	.856	.174	24.22	1	.000	2.354	1.674	3.311
	[18 or more]®	0[b]	.	.	0	.	.	.	.
	[No Education]	.748	.224	11.15	1	.001	2.114	1.362	3.280
	[Primary Ed.]	1.05	.256	17.14	1	.000	2.883	1.746	4.759
	[Lower Sec.]	.927	.275	11.38	1	.001	2.526	1.475	4.328
	[Middle Sec.]	.756	.220	11.86	1	.001	2.131	1.385	3.277
	[Higher Sec.]	.109	.236	.211	1	.646	1.115	.702	1.771

Children Ever Born	B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
[College/Uni.]®	0[b]	.	.	0	.	.	.	.
[Urban]	-.186	.128	2.124	1	.145	.830	.646	1.066
[Rural]®	0[b]	.	.	0	.	.	.	.
[Very rich]	.056	.224	.062	1	.804	1.057	.681	1.641
[Rich]	-.224	.189	1.404	1	.236	.799	.551	1.158
[Moderate]	-.196	.176	1.242	1	.265	.822	.582	1.160
[Poor]	-.259	.175	2.195	1	.138	.772	.548	1.087
[Very poor]®	0[b]	.	.	0	.	.	.	.
[Yes- Child loss]	16.95	.167	10270.4	1	.000	2.314	1.667	3.212
[No-Child loss]®	0[b]	.	.	0	.	.	.	.
[Western]	.018	.129	.020	1	.887	1.018	.792	1.310
[Central]	.142	.125	1.293	1	.256	1.153	.902	1.473
[Eastern]®	0[b]	.	.	0	.	.	.	.
[Ever used]	-.156	.136	1.316	1	.251	.856	.656	1.117
[Never used]®	0[b]	.	.	0	.	.	.	.

a. The reference category is: No children.

b. This parameter is set to zero because it is redundant.

Appendix D: Multinomial Analysis of Selected Socio-demographic Characteristics and Age (20 years and above) of Ever-married Women on CEB

Children Ever Born		B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
2-3 Children	Intercept	-2.33	.297	62.07	1	.000			
	[25 - 29]	1.75	.075	542.87	1	.000	5.761	4.972	6.675
	[30 - 34]	2.86	.102	789.17	1	.000	17.586	14.398	21.481
	[35 - 39]	3.15	.134	555.40	1	.000	23.339	17.960	30.330
	[40 - 44]	2.63	.136	374.77	1	.000	13.878	10.633	18.112
	[45 - 49]	2.77	.176	249.13	1	.000	16.035	11.361	22.631
	[20 - 24] ®	0[b]	.	.	0	.	.	.	.
	[15 - 17]	2.14	.172	154.49	1	.000	8.528	6.083	11.958
	[18 or more]®	0[b]	.	.	0	.	.	.	.
	[No Education]	2.21	.243	82.53	1	.000	9.130	5.666	14.713
	[Primary Ed.]	2.38	.273	76.44	1	.000	10.875	6.369	18.567
	[Lower Sec.]	2.02	.294	47.50	1	.000	7.606	4.271	13.544
	[Middle Sec.]	1.49	.244	37.59	1	.000	4.453	2.763	7.178
	[Higher Sec.]	.361	.275	1.73	1	.188	1.435	.838	2.458
	[College/Uni.]®	0[b]	.	.	0	.	.	.	.
	[Urban]	-.246	.130	3.56	1	.059	.782	.606	1.009
	[Rural]®	0[b]	.	.	0	.	.	.	.
	[Very rich]	.414	.226	3.35	1	.067	1.512	.972	2.354
	[Rich]	.129	.188	.468	1	.494	1.138	.786	1.646

Children Ever Born	B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
[Moderate]	-.120	.175	.472	1	.492	.887	.629	1.250
[Poor]	-.253	.174	2.11	1	.146	.777	.552	1.092
[Very poor]®	0[b]	.	.	0	.	.	.	.
[Yes- Child loss]	18.68	.060	98552.8	1	.000	1.300	1.157	1.461
[No-Child loss]®	0[b]	.	.	0	.	.	.	.
[Western]	.023	.129	.033	1	.856	1.024	.795	1.318
[Central]	.124	.126	.967	1	.326	1.131	.885	1.447
[Eastern]®	0[b]	.	.	0	.	.	.	.
[Ever used]	-.597	.151	15.67	1	.000	.550	.410	.740
[Never used]®	0[b]	.	.	0	.	.	.	.

a. *The reference category is: No children.*

b. This parameter is set to zero because it is redundant.

Appendix E: Multinomial Analysis of Selected Socio-demographic Characteristics and Age (20 years and above) of Ever-married Women on CEB

Children Ever Born		B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
4 or more	Intercept	-9.39	.904	107.92	1	.000			
	[25 - 29]	3.59	.303	141.32	1	.000	36.52	20.179	66.088
	[30 - 34]	5.90	.305	376.04	1	.000	367.54	202.313	667.696
	[35 - 39]	6.97	.315	489.75	1	.000	1068.78	576.283	1982.166
	[40 - 44]	7.11	.315	511.77	1	.000	1232.08	665.074	2282.474
	[45 - 49]	7.45	.333	502.54	1	.000	1726.72	899.894	3313.231
	[20 - 24] ®	0[b]	.	.	0	.	.	.	.
	[15 - 17]	2.80	.181	239.56	1	.000	16.564	11.609	23.635
	[18 or more]®	0[b]	.	.	0	.	.	.	.
	[No Education]	4.32	.762	32.12	1	.000	75.175	16.878	334.834
	[Primary Ed.]	4.35	.775	31.64	1	.000	78.024	17.096	356.089
	[Lower Sec.]	3.77	.793	22.64	1	.000	43.509	9.197	205.834
	[Middle Sec.]	2.03	.806	6.35	1	.012	7.624	1.571	37.006
	[Higher Sec.]	1.30	.902	2.09	1	.147	3.694	.630	21.651
	[College/Uni.]®	0[b]	.	.	0	.	.	.	.
	[Urban]	-.31	.153	4.12	1	.042	.733	.543	.989
	[Rural]®	0[b]	.	.	0	.	.	.	.

Children Ever Born	B	Std. Err.	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
							Lower Bound	Upper Bound
[Very rich]	-.28	.250	1.27	1	.258	.754	.461	1.231
[Rich]	-.29	.206	2.00	1	.156	.747	.499	1.118
[Moderate]	-.401	.189	4.52	1	.033	.670	.463	.969
[Poor]	-.43	.186	5.38	1	.020	.649	.451	.935
[Very poor]®	0[b]	.	.	0	.	.	.	.
[Yes- Child loss]	20.66	.000	.	1	.	9.471	9.4718	9.4718
[No-Child loss]®	0[b]	.	.	0	.	.	.	.
[Western]	-.22	.145	2.42	1	.120	.799	.602	1.060
[Central]	.008	.138	.003	1	.955	1.008	.769	1.322
[Eastern]®	0[b]	.	.	0	.	.	.	.
[Ever used]	-.66	.235	7.99	1	.005	.514	.324	.815
[Never used]®	0[b]	.	.	0	.	.	.	.

a. The reference category is: No children.

b. This parameter is set to zero because it is redundant.

VITA

The authorship of this research book is attributed to Mr. Kibu Zangpo. He was born on 10 June 1982 in Zhemgang, a district which was located in the central region of Bhutan. After completion of his middle secondary schooling from Zhemgang, he was placed to Drukgyel Higher Secondary School, Paro i.e. in the western part of the Kingdom (2000-2001).

Mr. Kibu has (BA English Honours) from Sherubtse College in 2004, affiliated to Delhi University, India. Before coming to pursue his Master of Arts in Demography from Chulalongkorn University in Thailand, he has served in the Election Commission of Bhutan for the past six years. As an Election Officer, he has extensively assisted the Commission to manage, monitor and supervision of the conduct of first historic parliamentary (2008) and local government (2011) elections in the country.

He had undergone a number of trainings on various fields including the Building Resources in Democracy, Governance and Election (BRIDGE) from Australia in 2008. For this, he was awarded a certificate of fully accreditation in 2011 on his recognition. Furthermore, he has served as a lecturer in the Royal Thimphu College, Royal University of Bhutan and taught on a module statistical method cum SPSS (Statistical Package for Social Science) to the final year BA students.

Most importantly, besides his busy schedule in collecting the data needed for the completion of this study from March through June, he was fully engaged in rendering the complete services on the conduct and management of second historic parliamentary elections (2013) in the country, because the Election Commission of Bhutan had recognized his greater and sincere services to the nation very urgently.

Finally, his interest for writing this research book was greatly influenced and highly motivated by his advisor Associate Prof. Dr. Pungpond Rukumnuaykit. Moreover, he strongly belief in making things happening with the great opportunity accorded. Now, his future interest and only a hope is to find-out solutions for ‘why do humans think their pain is different’ despite the fact that ‘pain is the same for everyone’.