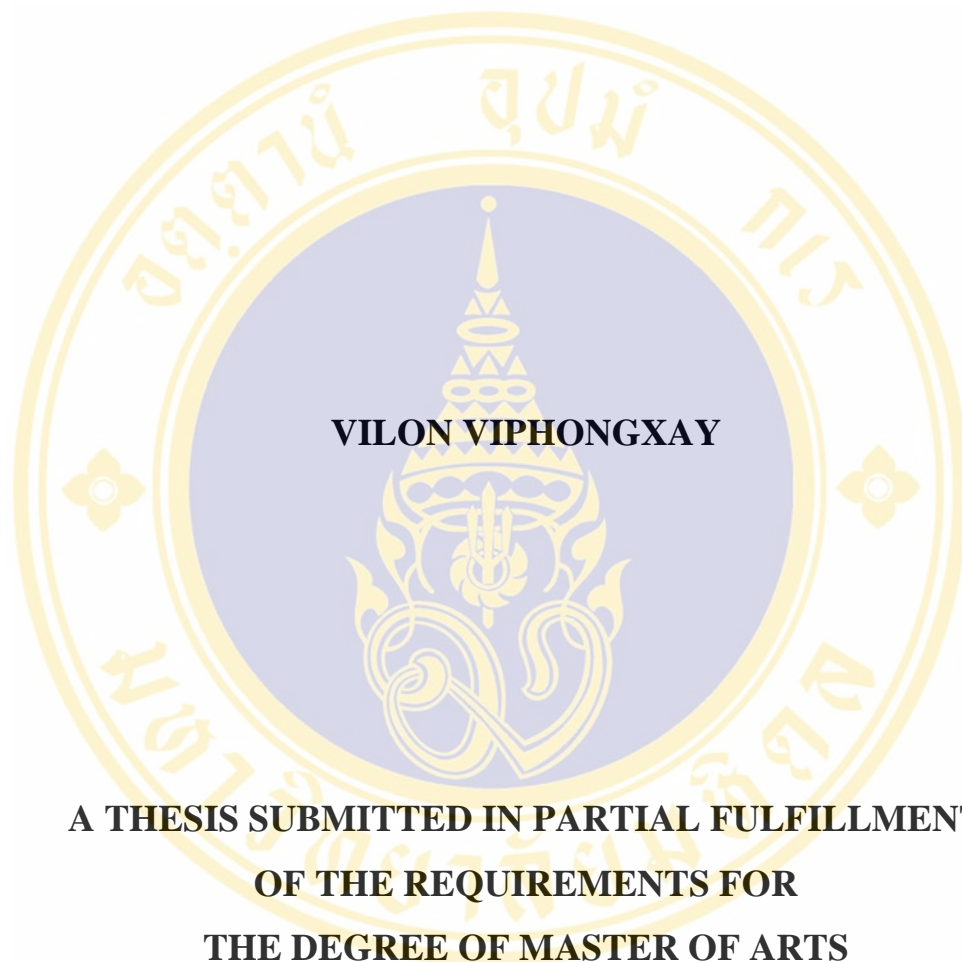


**WOMEN'S EDUCATION AND FERTILITY: EVIDENCE
FROM THREE PROVINCES OF LAOS**



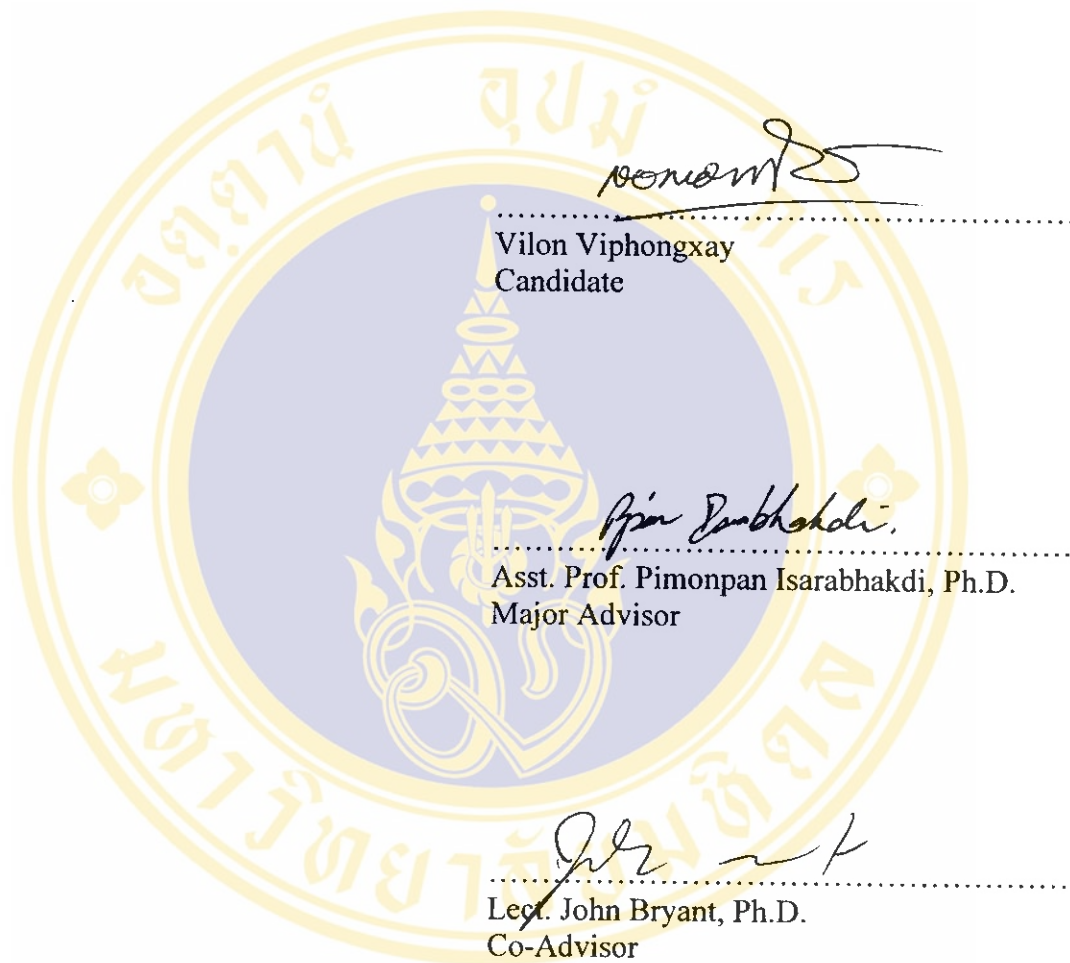
**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS
(POPULATION AND REPRODUCTIVE HEALTH RESEARCH)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY**

2007

COPY RIGHT OF MAHIDOL UNIVERSITY

Thesis
entitled

**WOMEN'S EDUCATION AND FERTILITY: EVIDENCE FROM
THREE PROVINCES OF LAOS**



Vilon Viphongxay

Vilon Viphongxay
Candidate

Pimonpan Isarabhakdi

Asst. Prof. Pimonpan Isarabhakdi, Ph.D.
Major Advisor

John Bryant

Lect. John Bryant, Ph.D.
Co-Advisor

M.R. Jisnuson Svasti

Prof. M.R. Jisnuson Svasti, Ph.D.
Dean
Faculty of Graduate Studies

Pimonpan Isarabhakdi

Asst. Prof. Pimonpan Isarabhakdi, Ph.D.
Chair
Master of Arts Program in Population and
Reproductive Health Research
Institute for Population and Social Research

Thesis
entitled

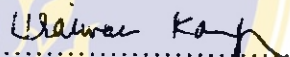
**WOMEN'S EDUCATION AND FERTILITY: EVIDENCE FROM
THREE PROVINCES OF LAOS**

was submitted to the Faculty of Graduate Studies, Mahidol University
for the Degree of Master of Arts
(Population and Reproductive Health Research)

on
August 14, 2007



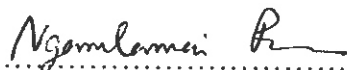
Vilon Viphongxay
Candidate



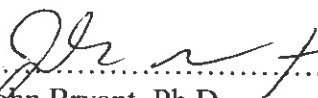
Assoc. Prof. Uraiwan Kanungsukkasem, Ph.D.
Chair



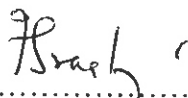
Asst. Prof. Pimonpan Isarabhakdi, Ph.D.
Member



Asst. Prof. Ngamlamai Piolueang,
Ph.D.
Member



Lect. John Bryant, Ph.D.
Member



Prof. M.R. Jisuson Svasti, Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University



Assoc. Prof. Churnrurtai Kanchanachitra, Ph.D.
Director
Institute for Population and Social Research
Mahidol University

ACKNOWLEDGEMENT

I would like to express my deepest thanks to the Director of National Statistics Centre, Deputy Directors and the representative of Statistics Sweden Project; Dr. Pettersson Hans, and as well as all my colleagues in the National Statistics Centre for providing me this valuable opportunity and giving me all possible supports. I express my gratitude to the Government of Lao PDR for the kindness of sending me to Thailand to improve and upgrade my knowledge on the Population and Reproductive Health Research, especially on the fertility and other related health issues.

It is my prestigious privilege to express my deepest thanks and appreciation to my major advisor Dr. Pimonpan Isarabhakdi, Director for MA International Program and my co-advisor Dr. John Bryant for their enthusiasm, constant guidance and valuable suggestion from the beginning till the end of my study. I am really grateful for their effort, that they provided me. I would like to express my gratitude to all of my lecturers who enlightened me by providing their endless knowledge during the course working; my sincere thank also goes to Khun Luxana Nil-Ubol, the Program Coordinator and her team members, and all staffs of Institute for the Population and Social Research as well as all my friends in Inter Master, Thai MA and PhD Program, specially Dr. Keonakhone Huamboon and Mr. Wanippol Mahaarcha for their warmest friendship.

Finally, my heartiest thank goes to my parents, my wife and my son for their moral encouragement and patience during my absence, my thanks also goes to my parent in law and cousins for their good caring on my family during one year of my absence.

Vilon Viphongxay

**WOMEN'S EDUCATION AND FERTILITY: EVIDENCE
FROM THREE PROVINCES OF LAOS**

VILON VIPHONGXAY 4938531 PRRH/M

M.A. (POPULATION AND REPRODUCTIVE HEALTH RESEARCH)

THESIS ADVISORS: PIMONPAN ISARABHAKDI, PhD.

JOHN BRYANT, PhD.

ABSTRACT

Though fertility in Laos has declined, high fertility still exists especially in rural and remote areas. This study focuses on the impact of women's education on cumulative fertility. All women aged 15-49 from three provinces, namely Phongsaly, Xiengkhuang and Champasak, enumerated in census 2005 were included in the study.

Univariate analysis was used to describe the demographic and socio-economic characteristics of the women, then bivariate analysis was used to assess the relationship between cumulative fertility and some key independent variables. Multivariate analysis (Ordinary Least Square Regression) was used to find out the effects of women's education on cumulative fertility, controlling for other factors. The result showed that educated women have fewer children than uneducated women. Furthermore, the multivariate analysis indicated that women's level of education has a significant negative effect on cumulative fertility. A stronger effect is found in women who have high education.

Because education affects long term fertility, if Government wants to have a sustainable improvement in the reproductive health of women and lower fertility, the educational development of women needs to be improved in parallel with other development programs. Future study should include other related intermediate variables to assess the net effect of education on fertility.

KEY WORDS: WOMEN'S EDUCATION/FERTILITY/ LAO P.D.R

42 pp.

CONTENTS

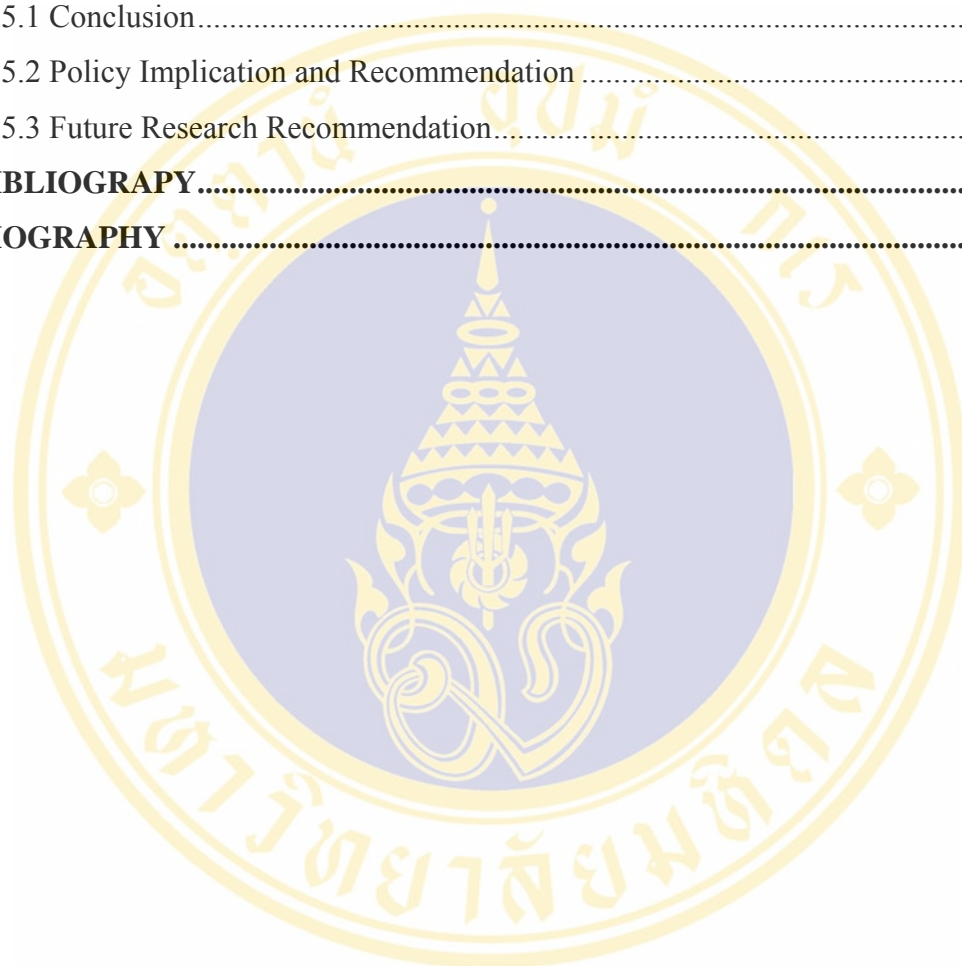
	Page
ACKNOWLEDGEMENT.....	iii
ABSTRACT.....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
CHAPTER I.....	1
INTRODUCTION.....	1
1.1 Background.....	1
1.2 Problem Statement.....	3
1.3 Problem Justification.....	4
1.4 Research Questions.....	5
1.5 Research Objectives.....	5
1.5.1 Overall Objective.....	5
1.5.2 Specific Objective.....	5
CHAPTER II.....	6
LITERATURE REVIEW.....	6
2.1 Socio-Economic Background of the Provinces.....	6
2.2 Studies of Women’s Education and Fertility.....	7
2.3 Fertility Determinants.....	8
2.3.1 Women’s Education and Supply of Children.....	8
2.3.2 Women’s Education and Demand for Children.....	10
2.3.3 Women’s Education and the Fertility Regulation.....	11
2.4 Differential of Fertility in Ethnicity.....	12
2.5 Differential Fertility in Place of Residence.....	13
2.6 Conceptual Framework.....	13
2.7 Hypotheses.....	14

CONTENTS (CONT.)

	Page
CHAPTER III.....	15
DATA AND METHODOLOGY	15
3.1 Data Source	15
3.2 Data Collection.....	15
3.3 Operational Definition of Variables.....	16
3.3 Operational Definition of Variables (CONT.)	17
3.3 Operational Definition of Variables (CONT.)	18
3.4 Data Analysis	18
3.5 Limitation of the Study.....	19
CHAPTER IV	20
RESULT AND DISCUSSION	20
4.1 Univariate Analysis	20
4.1.1 Demographic and Socio-economic Characteristics.....	20
4.1.2 Women by Education and Age Group.....	23
4.2 Bivariate Analysis	24
4.2.1 Mean of Children Ever Born by Some Demographic and Socio-economic Characteristics	24
4.2.2 Mean of Children Ever Born of Women by Educational Level and Age Groups	27
4.2.3 Percent of Women Distributed by Educational Level and group of Cumulative Fertility.....	28
4.3. Multivariate Analysis	28
4.3.1 Effect of Women’s Education on Cumulative Fertility.....	28
4.4 Discussion	32
4.4.1 Women’s Education Effects on Fertility	32
4.4.2 Other Covariates’ Effects on Cumulative Fertility.....	33

CONTENTS (CONT.)

CHAPTER V.....	35
CONCLUSION AND RECOMMENDATION.....	35
5.1 Conclusion.....	35
5.2 Policy Implication and Recommendation.....	36
5.3 Future Research Recommendation.....	37
BIBLIOGRAPY.....	38
BIOGRAPHY	42



LIST OF TABLES

	Page
Table 1. Socio-Economic Background of the Provinces.....	6
Table 2. Percent and Number of Women Distributed by Demographic and Socio-economic Characteristics.....	21
Table 2. Percent and Number of Women Distributed by Demographic and Socio-economic Characteristics (CONT.)	22
Table 3. Percentage of Women with Education and No Education by Age Group	24
Table 4. Mean of Cumulative Fertility by Demographic and Socio-Economic Characteristics	26
Table 5. Percentage of Women Distributed by educational level and Group of Cumulative Fertility.....	28
Table 6. Coefficient of Women’s Education Level and Other Factors on Cumulative Fertility by Provinces	31

LIST OF FIGURES

	Page
Figure 1. Conceptual Framework	14
Figure 2. Mean of Children Ever Born by Educational Level of Women	25
Figure 3. Mean of Children Ever Born of Women by Educational Level and Age Groups.	27



CHAPTER I

INTRODUCTION

1.1 Background

Lao PDR has the highest fertility in the ASEAN Region; the latest total fertility rate of the country is 4.5 children per a woman. In 1995, the Government has adopted the birth spacing policy which is the consequence from the International Conference on Population and Development in Cairo, 1994. This policy calls for the attention in fertility, population and development issues. The policy aims to slow down the fertility level of the country (Health, 1995). As a consequence, the fertility has declined ever since. The overall situation of fertility of the country seems to be stable and gradually declined; however the current fertility level of the country is two times higher than the replacement level which means that the population of the country is continuing to increase in the future. Meanwhile, the situation of the country will be under the risk to the status of lacking sufficient food and may face with social problems since the poverty level of the country is still high and over a quarter of the whole population is poor (Richter, Weide, & Souksavath, 2005).

Births control program for Laos is needed. It is an urgent task for Government, which will assist to reduce the vulnerable situation of high fertility of the country. In order to cope with such a high fertility and the situation of the country, Lao Government has launched the principle number VIII which set out the long term strategy plan and goals until year 2020. According to such an important principle the reproductive health policy which has objectives as (1) to promote the improvement of reproductive health for women, men and adolescent, (2) to promote the equality for gender in terms of information, health care service and other service and (3) to promote and improve the reproductive health attention among spouse and other people (Health, 2005) has been launched. Nevertheless, the rate of fertility is high in the country; especially in the rural area where the low status of education, low health care service utilization and high maternal and child mortality are commonly occurring.

In the most part of literature, fertility has been influenced by many factors, but the most important factor is education of women. Educated women are more likely to be attention with the quality of their children; education makes women get more exposed to the information. Education influences reproductive behaviors of women like age at first marriage, contraceptive use and the fertility preference (Martin, 1995; Martin & Juarez, 1995). In another word, it could be stated that women's education has influenced the supply of children and demand for children and as well as the fertility regulation and its cost.

Educational attainment is very important in influencing fertility decline. When comparing the marital age specific fertility rate of women who are illiterate and literate; it is found that educational attainment has negative relationship in all age group, but illiterate women, education has positive relationship (Anderson, 1975). Education of women is the most important factor that affects the fertility (Jain, 1981b). In 11 countries of the World Fertility Survey; it was found that education gives negative impact to fertility.

The fertility information of Lao.PDR is available since the second census 1995, the reproductive health survey in year 2000 and the most recent census in 2005. The existing literature in the country appears to be less and insufficient in term of effective policy implication since all literatures address the general picture of the fertility only. Therefore, the in-depth study on fertility is needed in order to visualize and map out the sustainable policy for the reproductive health of women.

This study aims to test whether the education of women affected their fertility, and the effect is compared among educational level of women and by provinces. Three provinces, namely Phongsaly, Xiengkhuang and Champasak province are selected from Population and Housing Census 2005 and all women age 15-49 year are included. Formal educational level of women is the main independent variable while other variables like age of women, marital status, ethnicity, place of residence, occupation and other household characteristics would be functioned as control variables. In order to verify the impact of independent variable on the cumulative fertility the Multivariate Analysis (Multiple Linear Regression) is used in this study.

1.2 Problem Statement

Fertility information estimated from the second Population Census 1995 until the latest Census in 2005 and compared with other data source like the Lao Reproductive Health Survey in year 2000 show that fertility in the whole country is slowly declining. The fertility of the whole country is slowly reduced from 5.0 in year 1995 (Committee & Centre, 1997) to 4.8 in year 2000 (Sisouphanthong, Xaovana, Louangvixa, & Chanthalanouvong, 2000) and to the latest level 4.5 in 2005 (Housing, 2005). However it is considered as too high since it is two times of the replacement level and it is higher than all neighboring countries like: Thailand 1.7, Vietnam 2.1, Cambodia 3.7, Myanmar 2.5 (Bureau, 2006). It is commonly seen and perceived that family with large family size is more likely to be insufficient in term of opportunity in society like education (Knodel & Wongsith, 1991) as well as economic welfare, because larger family size spend large share of consumption that affects the per capita income (Espenshade, Kamenske, & Turchi, 1983). In the whole country the proportion of people whose expenditure consumption is under the national poverty line are accounted as 35.3 percent in year 2002 (Richter et al., 2005)

Households with low social background are more likely to have high fertility and lead them to face with social problems which inversely affect the development of the community and the country. Family planning knowledge and practice is still low; it varies from province to province. The knowledge of family planning in some provinces; especially in rural and remote area like mountainous province such as Phongsaly province is only 29.8% for modern method (Sisouphanthong et al., 2000).

Ethnic minority is another constraint for fertility control in the country. Through out the country, there are 49 ethnic group or 45 percent of all population in the country (Housing, 2005). They are mainly living in the mountainous areas. The fertility of ethnic minority is more likely to be high when comparing to the fertility of Lao ethnic women.

The decline of fertility of the country is occurring at the same time as the growing of the formal education system in the country. Government of Laos has emphasized and put many affords to develop the school system which makes high enrollment ratio in primary school of children (Education, 2005). Recently education

sector has been set as a prioritized sector until year 2020 by Lao Government (National Growth Poverty Eradication Strategy). The literacy rate of women for the total country increases from 47.9 percent (1995) to 63.2 percent (2005). Phongsaly province, the literacy rate of women increases from 25.0 percent (1995) to 33.6 percent (2005). Xiengkhuang province, the female literacy rate increases from 47.1 percent (1995) to 61.8 percent (2005). And Champasak province, the female literacy rate increases from 59.4 percent (1995) to 74.0 percent (2005) (Committee & Centre, 1997; Housing, 2005).

1.3 Problem Justification

Large family size or high fertility is one factor that affects to the welfare status of the household (Espenshade et al., 1983). Households with many family members are facing with the problems of less supply of economy. With more share in the household, parents are unable to manage the poverty situation; and in order to help parents with family support some children have to stop schooling and attend in the agricultural works or join in the labor market early and some of them are attending in the illegal activities and lead to put up social problems for society as well as the country. Thus the fertility control programs should be considered among the key policy makers and the issue of population growth and development should be taken as one prioritized agenda in searching for an appropriate resolution.

Education is one factor to make women get more exposure to modernization as well as information which lead people to perceive the right way of living in the society. Education could support people to have good social status in the society. Education helps women and general people to develop them in earning income, living and how to live with good quality of life in the society. Educated women must perceive the good things from lessons and experiences that they got from out side world, from the schools and bring those knowledge and skills to practice with their real life, especially in reproductive behaviors. Fertility of uneducated women is considered as higher than the other counter part like educated women (Martin & Juarez, 1995), therefore the study on the consequence of women's education on fertility is necessary and needed to be tested in the country like Laos and find out whether the education expansion of women has any effect on their fertility or not?

1.4 Research Questions

1. What is the level and pattern of cumulative fertility among uneducated and educated women?
2. What is the effect of education level of women on their cumulative fertility?

1.5 Research Objectives

1.5.1 Overall Objective

To provide a comprehensive study about the women's formal education level and cumulative fertility for the national and sub national policy makers to use in the reproductive program formulation

1.5.2 Specific Objective

1. To find out the level and patterns of cumulative fertility among educated and uneducated women
2. To test whether education of women has affected their cumulative fertility or not?

CHAPTER II

LITERATURE REVIEW

2.1 Socio-Economic Background of the Provinces

Table 1 presents some socio-economic and demographic characteristics of the provinces. Among these three provinces, Champasak province has largest population and the smallest is Phongsaly province. Better female education is found in Champasak province; the literacy rate in this province is higher than other provinces while the lowest rate of female literacy is Phongsaly province.

Table 1. Socio-Economic Background of the Provinces

Some Socio-economic Development Indicator	Provinces		
	Phongsaly	Xiengkhuang	Champasak
Population (Th.p) ¹ *	165.9 (2005)	229.6 (2005)	607.4 (2005)
Female literacy rate (Percent)*	33.6 (2005)	61.8 (2005)	74.0 (2005)
Total fertility rate (Children per women)*	5.1 (2005)	5.9 (2005)	4.2 (2005)
Infant mortality rate (Death per 1000 live births)*	68.0 (2005)	68.0(2005)	67.5 (2005)
Contraceptive use**	19.8 (2000)	24.0 (2000)	23.2 (2000)

Data source: * Population and Housing Census 2005

** Lao Reproductive Health Survey 2000

In terms of the reproduction of women, the fertility rate or the total fertility rate of Xiengkhuang province is higher than other provinces while Champasak province has lower level of fertility. Infant mortality rate reflects the socio-economics development of each province, among these three provinces; the rate of infant mortality is not much different; Phongsaly and Xiengkhuang share the same level while Champasak province has lowest rate. Contraceptive use determines fertility level of women, among these provinces the lowest rate of contraceptive use is found in Phongsaly province while the highest rate is found in Xiengkhuang province; however

the rate is not much different (19.8 percent in Phongsaly, 13.2 percent is in Champsak and 24.0 is in Xiengkhuang province).

2.2 Studies of Women's Education and Fertility

In general, there are many factors that affect fertility, but the most significant factor is the education of women or female education (Jain, 1981a; Martin & Juarez, 1995). In Lao PDR there is no such specific study on this issue. Jain (1981) studied the relationship between female education and fertility by using data from World Fertility Survey of eleven countries. He found that the patterns of female education and fertility are similar in all countries. The cumulative fertility is decreased when the education of all countries is increasing. The effect is not only from the higher level of education but also the lower education. In order to investigate this relationship he composed an indicator called "U" which took the mean number of cumulative fertility divided by the mean number of cumulative fertility of all level of education. He found that the fertility is affected; therefore it could be stated that female education strongly affects the fertility. In 9 Latin American Countries, the relationship of education and fertility is very strong, and the differential of fertility is found in actual number of children among educational level of women; however the desired number of children or the family size norm is the same among these women (Martin & Juarez, 1995).

Martin (1995) uses data from 26 countries from four main regions of the world to test the relationship of women's education and fertility; he has found that education gives impact to fertility through age at marriage, fertility preference and contraception. Education supports women to postpone marriage, to have small family norm and support women to use contraception. There is a research on the determinants of fertility in Nepal; the researcher had focused on the investigation of the significant of the fertility determinant. The fertility he was interested is the cumulative fertility (Pradhan, 1993). He found that as the level of education increases the proportion of cumulative children decrease. In Ghana, a researcher studied the determinants of cumulative fertility by grouping currently married women into four groups: age less than 34 year by urban and rural, and age 35 to 49 by urban and rural. The findings he found are consistent, the education level of women has negative effects on the number

of cumulative fertility (Tawiah, 1984). However, among four groups of them there is some conflict among primary level of under 34 in the urban area that has positive relationship with fertility, but it is just a very small and not significant to conclude. In addition, between male and female, the study suggested that female education has stronger determinant in fertility than male (Breierova & Duflo, 2004). Omaiba (2003) uses the data from the Demographic Health Survey to test the effect of women's educational attainment on the pattern of fertility in Kenya, the finding indicated that the positive effect is found for contraceptive and negative effect is for the desire fertility.

2.3 Fertility Determinants

Fertility determinants are popularly interested by many researchers and scholars, fertility is determined by three components: Demand for Children, Supply of Children, and Fertility Regulation and its Cost (Bulatao, Lee, Hollerbach, & Bongaarts, 1983). In the most part, women's social position influence fertility (Mason, 1987) through the supply and demand for children, as well as through the costs of regulation; however the social position of women is the consequence from their education.

2.3.1 Women's Education and Supply of Children

Education of women affects the supply of children through these following intervening variables: Age at marriage; breast feeding and child mortality (Akin et al., 1981; Gangadharan & Maitra, 2001; Ikamari, 2005; Muhuri, 1995). Education tends to increase the age at first marriage which decreases the number of years that women can be devoted to child bearing (Tawiah, 1984). This relationship between women's education and age at marriage has been found in almost all fertility studies. A study of 26 developing countries, it is found that age at marriage customarily increases with the level of women's education in all of the countries examined (Martin, 1995). Women with higher education levels are more likely to be able to organize their lives outside the realm of marriage and family formation.

Age at marriage has been affected by the education of their own, education has been found that it has the positive relationship with age at marriage of women (Gangadharan & Maitra, 2001; Ikamari, 2005). School participation removes the girls from the domestic environment and offer literacy and support them to get exposure to new things, new ideas which gradually cleans the old traditional custom of early marriage out and then they value the marriage or life of marriage. Increasing age at marriage could affect the fertility of women. Higher female education has been shown to lead to a postponement of marriage and to later family formation (Martin, 1995). In Pakistan, it is found that education has significant positive relationship with age at first marriage, educated women got marriage at later age, however education of women does not affect the duration between marriage and first birth (Gangadharan & Maitra, 2001).

Prolonged breast-feeding is one of the traditional practices that serve as a means of contraception. With increases in the levels of education of women, the period of breast-feeding tends to decrease (Akin et al., 1981). Breast feeding practices are affected by education, educated women knew and perceived the benefits to their children's health, therefore educated women are more like to control themselves in continuing breast feeding as long as possible for their healthy children.

Child Mortality, high rates of child mortality reduces the supply of children, which in turn increases the demand for children (Bulatao et al., 1983). The existence of a linear relationship between mother's education and child mortality has been well described (Kravdal, 1983) . With a high rate of child survival, parents can be certain that they do not need to have many babies in order to maintain their desired family size. Moreover, with the death of an infant, duration of breast feeding and post-partum abstinence is shortened (Park, Isam, Chakraborty, & Kantner, 1998), which support high fertility; however the survival of children increase the intervals between births and widen the post-partum abstinence period. Female education affects child survival and lead women to have low fertility.

2.3.2 Women's Education and Demand for Children

Women's education has an impact on the demand for children through these variables: Family size and norm, or fertility preference, Labor contributions of children, and Economic costs of raising children. Desired family size and norm: With education, women become much less fatalistic regarding their family size. In most research studies it has been found that desired family size becomes smaller with the increase in women's educational levels (Jaime, 2006; Martin & Juarez, 1995). However, the strength of relationship varies from culture to culture depending mainly on the degree of gender stratification in the society under study. Fertility preference is a common feature which plays a crucial role in shaping the fertility level; better-educated women generally want smaller family size than uneducated women. The reasons are linked to a shift in women's attitudes toward childbearing and in their perception of the cost of child rearing (Martin, 1995).

In the past, Lao people based mainly in the agriculture work, the perception of old people especially parents are likely to expect the contribution in labors from their children and it was very common in the past to see and hear one family should have many children to help them in agricultural work. However; now that culture has been changed due to the extent of education; especially the education of women. Better educated women are more likely to educate their children and to send them to school that reduces the children laboring (Nath & Hadi, 2000). Their expectations with regard to their children's labor are not as great as those of uneducated women who believe that the function of children is to help their parents in economic activities.

Economic, opportunity and time costs of children, quality of children is perceived by educated parents and doing that; it requires enough financial afford. That seems to be costly. Education increases cost of children, parents are not responsible only the education fee but also clothing, luxurious payments in order to make their children equal to other children in the society (Caldwell, 1980; Ho, 1979) hence reducing the number of desired children and fertility is perceived by educated parents. The opportunity cost is related to the employment, educated women are more likely to be engaged in paid employment outside the home. High fertility affects the women's employment (Kyriazis & Henripin, 1982) therefore if they have more children; not

only the economic cost will rise but also they may miss the good opportunity to get a good job . Besides this opportunity cost, better educated women also feel it is necessary to spend more time with children and are less likely to leave their young kids in the care of older people, siblings and cousins. Perhaps, they have to hire the baby sitters to take care children during they go out to participate in the employment and this issue may relate to the economic cost; however this kind of difficulty leads educated women to value number of desired children. Education affects the perceptions of mothers in terms of economic cost, opportunity and time cost.

2.3.3 Women's Education and the Fertility Regulation

Education of women has positive and significant relationships with contraceptive use (Jaime, 2006; Shapiro & Tambashe, 1994); women's education affects the use of contraception through the attainment of knowledge regarding contraception and through increased spousal communication. Education increases knowledge of contraception and supports the prevalence of contraceptive use which means to control and limit child bearing. Women's education level is having positive relationship with the contraceptive use, especially the higher education level (Shapiro & Tambashe, 1994). The effect is higher when education is higher; however the higher education affects more on the modern method of contraception. Better educated women are more likely than others to desire smaller family size and hence have a stronger motivation to practice contraception. Educated women are also less prone to have fatalistic attitude toward life and to accept the unpredictability of unregulated fertility. In many traditional societies, where contraception is not a socially sanctioned practice, education can play an important role in enabling women to engage in the new pattern of behavior (Martin, 1995). In Kenya, it was found that educational attainment has effected the contraceptive use of women, even controlling by other factors (Omariba, 2003).

2.4 Differential of Fertility in Ethnicity

Different ethnic people may perceive different thinking toward the reproductive behaviors, for instance in Cameroon; women come from two different ethnic groups; these young women have different perception in reproductive behaviors; one expects to enjoy premarital sexual and hold sex as part of the adolescent life while other counterpart expect to marry when they are adults and have children as many as god could give them (Johnson-Hanks, 2003). The differential in fertility is related to the belief of each ethnic. In Lao PDR there are 49 ethnic groups (Housing, 2005) and each group may have different way of life, different goal of life and different geographic location, the situation of Laos may not different from the example in Cameroon.

In Thailand, ethnic minority that live in the mountainous or hill area has the highest fertility rate compared to other ethnic minorities in the country (Leamsuwan, 2003), the factor that leads them to have higher fertility may be related to the location of their villages which are difficult to reach. Mountainous area is the place where the hill tribes are likely to live, these people may lack of information; especially the information about the family planning. Majority of ethnic minorities live in the rural area, therefore the opportunity of earning income is difficult, and they are likely to have lower income than people who live in the urban area (Prasithrathsint, 1985).

The ethnic people are more likely to have lower socio-economic characteristics than the low land people especially people that inhabit in the town or urban area. They have also low rate of contraceptive due to their low knowledge on birth control. Some culture denies contraception. According to the result from the Reproductive Health Survey in year 2000, it is found that only 76 percent of currently married women have heard about any method of contraception (Sisouphanthong et al., 2000). Ethnic people are not only reported to have large current and cumulative fertility but also high ideal family size and norm. Age at first marriage is known as an important determinant for fertility but it is determined by cultural and socio-economic development (Wong & Meng, 1985). Thus ethnic minorities group are vulnerable in having high fertility due to their lower socio-economic characteristic and their diversified cultures. These make women get married at younger age which support high fertility.

2.5 Differential Fertility in Place of Residence

Between urban and rural, it is found that people in the urban are more likely to use contraceptive than rural area therefore fertility differential may be happened between urban and rural (Sisouphanthong et al., 2000). There is a study on the fertility trend by comparing two times period of DHS survey, anyway it is found that urban fertility is lower than of rural due to the younger age and older age of people are more likely to use contraceptive while in rural area the younger age did not much practice the contraception (Retherford & Thapa, 2003). On the other hand, the differentials in urban and rural fertility is because of the differential in age at first marriage, women in rural are more likely to enter into marriage earlier than urban women (Zarate, 1967).

It is commonly seen that the people in the rural area are more likely to marry at earlier age than in urban. This situation is similar to the situation of Laos where the rural people get married earlier due to they may stop schooling earlier; however it makes those women enter to marriage union earlier than in urban. In Nepal, the longitudinal analysis technique is used to study the fertility trend by observing the information from 1996 to 2001 Demographic Health Survey. They found that the total fertility rate in all estimations for women in urban is lower than their counter part in rural area (Retherford & Thapa, 2003).

2.6 Conceptual Framework

The conceptual framework utilized for this study is presented in Figure 1. The working hypothesis is that, the educational attainments which represented by the formal education level of women influence the fertility of their own after controlling by other covariates. Education of women does not directly affect fertility; it influences fertility through the intermediate variables. However in this study, the intermediate variables like age at marriage, breast feeding, child mortality and contraceptive use are unavailable.

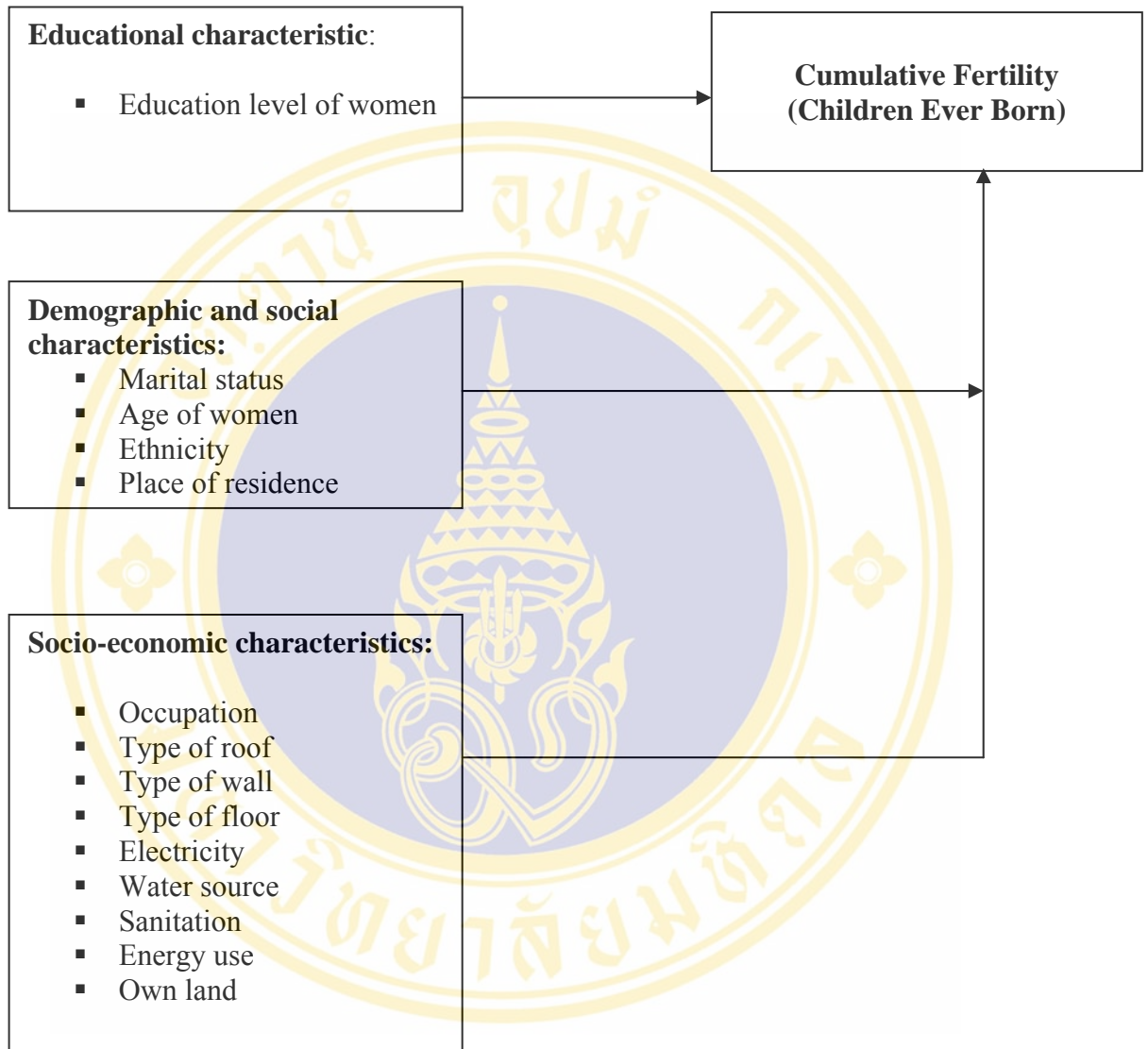


Figure1. Conceptual Framework

2.7 Hypotheses

Women’s educational level has negative effect on their cumulative fertility

CHAPTER III

DATA AND METHODOLOGY

3.1 Data Source

Data utilized in this study is from the population census 2005 which is conducted by National Statistics Centre, the Committee for Planning and Investment. In Laos three population censuses have been conducted since 1985, the frequency of census conducting is 10 years; the latest census is jointly funded by the Lao Government and Statistic Sweden Programs. National Statistics Centre is assigned as the key leader in implementing this historical census, the result was first processed by manual and then by the scanning system. Three provinces namely Phongsaly, Xiengkhuang and Champasak are selected for this study. The selection of the provinces is based on the level of children ever born. Level of children ever born in the country is grouped in three categories of low, medium and high. Then, the random selection is done by picking up one province from each group. It is very interesting to investigate how the education of women plays a role in fertility decline among these three provinces. The enumeration units are all women whose ages are from 15 to 49 year old, the total number of women used in this study is 214,474. The measure of cumulative fertility (the dependent variable) used is the number of children ever born to a female (Tawiah, 1984). The respondents age 15 to 49 were asked to report all number of children ever born (ever live births) to them who live (a) in the house, (b) live elsewhere, and (c) who died.

3.2 Data Collection

Data collection was implemented in the duration of one week from 1st to 7th of March 2005, data was collected on the same time through out the country, the enumerators for this transaction are mainly the village head men and other staffs from village based organizations like women union, security and youth union. In each area

of data collection supervisors are assigned to assist and follow up the implementation of the activities. The target respondents are those who are the head of the household. And in case of the head of the household is not available; the senior, eldest children or the people who know the history of the household are substituted.

3.3 Operational Definition of Variables

Variable	Definition	Measurement
Dependent Variables:		
Cumulative fertility	The numbers of all children that ever born to women, it is including the living children, children that live else where while data collecting and the death children.	Ratio
Independent Variables:		
Formal education	The school system that consists of the primary school, lower-secondary school and upper secondary school. Primary school consist of 6 years, lower secondary school 3 years and upper secondary 3 years.	No education= Ref. category Primary= 1 & other =0 Lower secondary=1& other =0 Upper secondary=1&other =0
Marital status		Widowed = Ref. category Never married = 1 & other =0 Married = 1 & other =0 Divorced = 1 & other = 0
Age of women	Current age of women at the time of data collection	Interval

(CONT.)

3.3 Operational Definition of Variables (CONT.)

Ethnicity	Refer to the ethnic tribe of women	Dichotomous (1,0) Lao tribe = Ref. category Khamu = 1 & others = 0 Yaroo = 1 & others = 0 Akha = 1 & others = 0 Mhong =1 & others = 0 Other = 1 & others = 0
Place of residence	It is refer to the place where they are living and reside at the time of data collection	Dichotomous (1,0) Urban =1 & rural = 0
Occupation	1: Government employee, Private employee, State enterprise employee, Employer, Own account worker, 0: Unpaid family worker, unemployed, Household duties, Retired/sick/too old ,student and other	Dichotomous (1,0) Employed = 1 & unemployed = 0
Roof	1: Tile, zinc, 0: Wood, bamboo tree, grass, others	Dichotomous (1,0) Good type of roof = 1 & Not good type of roof = 0
Wall	1:Blick/concrete, wood 0:Bamboo tree, others	Dichotomous (1,0) Good type of wall = 1 & Not good type of wall = 0
Floor	1: Ceramic/tile, concrete, wood 0: Bamboo, others	Dichotomous (1,0) Good type of floor =1 & Not good type of floor = 0

(CONT.)

3.3 Operational Definition of Variables (CONT.)

Electricity	1: Yes, own meter, yes, share meter yes, car battery , generator, 0: No use	Dichotomous (1,0) Use electricity =1 & Do not use electricity = 0
Water source	1= Pipe water, well, bore hole protected, borehole unprotected 0= River/stream/dam, water from mountain, rain water and others	Dichotomous (1,0) Secure source of water =1 & un-secure source of water = 0
Sanitation type	1= Modern toilet, normal toilet 0= Others and no use	Dichotomous (1,0) Use toilet = 1 & Do not use toilet = 0
Energy use for cooking	1= Electricity, fuel, Gas, Charcoal and coal 0= Wood, sawdust and others	Dichotomous (1,0) Use good source of energy = 1 & Do not use good source of energy = 0
Own agriculture land	Referring to the agricultural land that their family is owning or operating	Dichotomous (1,0) Have owned = 1 & Have not owned =0

3.4 Data Analysis

Initially the descriptive analysis or univariate analysis is used to describe the demographic and socio-economic of the respondents, and then the bivariate analysis is used by using one-way ANOVA to assess the relationship between cumulative fertility and some key demographic and socio-economic variables. And in order to study the pattern of the cumulative fertility of uneducated and educated women, the proportion of women by number of cumulative is calculated and comparing among women with education and no education.

The research question is aimed to find out whether or not education level of women give negative effect on cumulative fertility with controlling by other factors. In order to respond the research question, the multivariate analysis (Multiple linear regressions model) is used; the purpose is to find out the effects of women's education level on cumulative fertility and compare among provinces. For all independent

variables; however dummy (0 & 1) technique is essential and applied to all nominal variables. The process of modeling is to apply all independent and control variables as one model and observe the effect from result with regards to education level of women. The SPSS Statistical Software Version 11.5 is used in this study.

3.5 Limitation of the Study

This study uses the secondary data and can not get information on the intermediate variable of fertility like, age at first marriage, breast feeding, ideal family size and contraceptives use which are very important to determine fertility level. Variables that could measure the economic status of the women or their family such as income per month and expenditure consumption are not available in the census. Quantitative is a good approach in the fertility study; however in term of the additional logical explanations on the issues of supply of children, demand for fertility and fertility regulation and the supply of family the qualitative approach is also needed.

CHAPTER IV

RESULT AND DISCUSSION

Results of the study are presented in three sections, the first section deals with the univariate analysis on the characteristics of the respondents, second section is the bivariate analysis which consists of the comparison of mean of cumulative fertility by some key independent variables by using one-way ANOVA test, and then the third section is the presentation of multivariate analysis by using multiple regression model to test the effect of educational level of women on cumulative fertility.

4.1 Univariate Analysis

4.1.1 Demographic and Socio-economic Characteristics

Table 2 presents the percent and number of women distributed by demographic and socio-economic characteristics. In this study, 214,474 women aged 15-49 years were included in the analysis. The majority of the women have primary education which covered 43.90 percent of all women. However, the proportion of women with no education is high which is higher than a quarter of all women. Women who are currently married covered the majority of the total women and accounted as 65.81 percent while never married women cover a quarter of the whole women, only 4.71 percent of women are divorced and widowed. Most of women are in the age group of 15-19 covers 23.26 percent and the lowest proportion is in the 45-49 age group that covers 8.96 percent. Women are also grouped into the ethnic tribes; however the majority of the women is Lao tribe which covers 64.70 percent while other counterparts cover less than ten percent like Mhong, Khamou, Akha and Yaroo.

Regarding place of residence, most of them live in rural area and covers 79.05 percent while in the urban the proportion is 20.95 percent. The percentage of women who are unemployed covers the majority of the women in this study that covers 70.29 percent while those who are employed cover only 29.71 percent. In term of socio-

economic characteristics, the material that women's houses or shelters are made of are selected and use as a part of the socio-economic assessment, the finding shows that most of them have good condition of house since the proportion of women whose houses use good types of material cover majority of the whole women such as type of wall, roof and floor which is 76.03 percent, 76.99 percent and 80.71 percent respectively.

Table 2. Percent and Number of Women Distributed by Demographic and Socio-economic Characteristics

Social & Demographic and economic characteristics	Percent	Number of women
Formal education		
No education	26.38	56,576
Primary education	43.90	94,149
Lower secondary education	18.88	40,502
Upper secondary education	10.84	23,247
Total	100.00	214,474
Marital status		
Never married	29.47	63,215
Married	65.81	141,145
Divorce	3.03	6,509
Widowed	1.68	3,605
Total	100.00	214,474
Age group		
15-19	23.26	49,881
20-24	17.35	37,207
25-29	15.12	32,429
30-34	12.96	27,794
35-39	12.59	27,012
40-44	9.76	20,942
45-49	8.96	19,209
Total	100.00	214,474
Ethnicity		
Lao	64.70	138,767
Kamou	5.30	11,367
Yaroo	2.95	6,323
Akha	4.22	9,056
Hmong	8.15	17,478
Others	14.68	31,483
Total	100.00	214,474
Place of Residence		
Urban	20.95	44,941
Rural	79.05	169,533
Total	100.00	214,474

(CONT.)

Table 2. Percent and Number of Women Distributed by Demographic and Socio-economic Characteristics (CONT.)

Social & Demographic and economic characteristics	Percent	Number of women
Occupation		
Unemployed	70.29	150,757
Employed	29.71	63,717
Total	100.00	214,474
Type of roof		
Not good type of roof	23.01	49,357
Good type of roof	76.99	165,117
Total	100.00	214,474
Wall		
Not good type of wall	23.97	51,416
Good type of wall	76.03	163,058
Total	100.00	214,474
Floor		
Not good type of floor	19.29	41,367
Good type of floor	80.71	173,107
Total	100.00	214,474
Electricity		
Do not use electricity	47.75	102,402
Use electricity	52.25	112,072
Total	100.00	214,474
Water source		
Do not use good water source	45.64	97,876
Use good source of water	54.36	116,598
Total	100.00	214,474
Sanitation		
Do not use toilet	72.72	155,972
Use toilet	27.28	58,502
Total	100.00	214,474
Energy use for cooking		
Do not use good source of energy for cooking	78.67	168,735
Use good source of energy for cooking	21.33	45,739
Total	100.00	214,474
Agriculture land		
Do not own agriculture land	28.37	60,840
Own agriculture land	71.63	153,634
Total	100.00	214,474

Half of women 52.25 percent live in the household that use electricity; however for those who do not use electricity covers the 47.75 percent which is considered to be high. It is similar to the situation of the secured source of water utilization, a bit higher than half of women that have access to a good source of water

or 54.36 percent while 45.64 percent of women use an unsecured water source. Sanitation situation among these women seems to be poor. Only 27.28 percent of women that their household uses the toilet and other 72.72 percent of them do not use toilet. In addition, the energy use for cooking is as another component in socio-economic assessment; the result shows that 78.67 percent of them do not use a good source of energy while 21.33 of them use a good source of energy, and the agricultural land owning is 71.63 percent and 28.37 percent of them do not own land.

4.1.2 Women by Education and Age Group

Table3 presents the proportion of women by education and age group. Women with no education; their percentage distributed by age group ranges from 11.32 percent in the age group of 40-44 to 16.90 percent in the age group of 25-29. The differential among age group of no education group of women is not so high. In primary education, the highest proportion is in the 15-19 age group which is 20.55 percent and the lowest is in the 45-49 age group which is 10.73 percent. In the lower secondary education, the percentage distributed ranges from the highest 31.10 percent in the first age group to the lowest 3.03 percent in the last age group. And for the women who have upper secondary education; their proportion is very small in the age group of 45-49 which is 2.38 percent. The highest proportion of women with upper secondary education is found in the age 15-19 which is 39.54 percent. According to the result, it has been observed that proportion of women with high education is large in young age group compared to the older age group of women.

Table 3. Percentage of Women with Education and No Education by Age Group

Formal education	Age group							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
No education	15.45	15.62	16.90	14.56	13.21	11.32	12.95	100.00
Primary education	20.55	17.21	15.27	12.07	12.86	11.30	10.73	100.00
Lower secondary education	31.10	16.52	13.66	15.00	13.61	7.08	3.03	100.00
Upper secondary education	39.54	23.56	12.71	9.12	8.25	4.43	2.38	100.00
Total	23.26	17.35	15.12	12.96	12.59	9.76	9.96	100.00

4.2 Bivariate Analysis

4.2.1 Mean of Children Ever Born by Some Demographic and Socio-economic Characteristics

Table 2 presents the comparison of cumulative fertility mean by demographic and socio-economic characteristics, using one-way ANOVA. It shows that the average cumulative fertility of each group is statistically different at 0.001 significant level. On average the cumulative fertility of women by their level of formal education and no education ranges from 0.86 children per a woman for the upper secondary educated women to the highest which is 3.09 children per a woman for uneducated women. The average cumulative fertility of women with primary and lower secondary education is 2.57 and 1.69 children per a woman respectively. (Please also see Figure 2)

Regarding cumulative fertility by marital status of women, the widowed women have higher fertility than other group of women. Married women have the second highest fertility; the mean number of children ever born is 3.65 children and 3.39 children respectively. Age is known as the determinant that has positive relationship with cumulative fertility, it has been observed in this study that as age increase the fertility also increases. The mean number of children ever born of women age 45-49 year is 4.96. Among ethnic tribes, Lao tribe has the lowest cumulative

fertility; it is 2.21 children per a woman. Hmong tribe is found to have the highest cumulative fertility; it is 3.10 children per a woman. In addition, for some selected variables that reflect the socio-economic status of women like electricity and water source; it is found that all of women who have better status of socio-economic characteristic have fewer cumulative fertility.

When looking at fertility differentials by provinces, Xiengkhuang province has the highest cumulative fertility children per a woman while the lowest is in Champasak province. Xiengkhuang province is one of mountainous provinces. In this province; the majority of people are Lao and Hmong tribes. When compared fertility by place of residence, it has been observed clearly that urban and rural has a big difference in terms of fertility level; urban women have fewer children than those who live in the rural area.

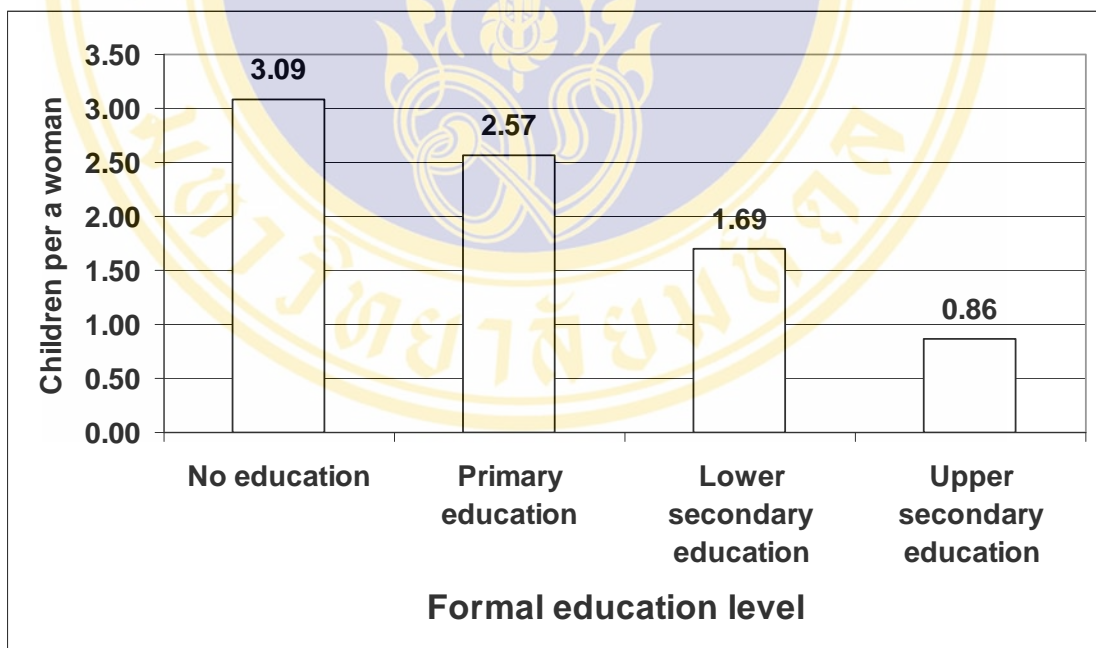


Figure 2. Mean of Children Ever Born by Educational Level of Women

Table 4. Mean of Cumulative Fertility by Demographic and Socio-Economic Characteristics

Demographic and Socio-economic Characteristics	Mean	F
Formal education		5,654.39***
No education	3.09	
Primary education	2.57	
Lower secondary education	1.69	
Upper secondary education	0.86	
Marital status		39,511.20***
Never married	0.02	
Married	3.39	
Divorce	1.89	
Widowed	3.65	
Age group		32,288.51***
15-19	0.11	
20-24	0.97	
25-29	2.15	
30-34	3.20	
35-39	4.09	
40-44	4.74	
45-49	4.96	
Ethnicity		425.73***
Lao	2.21	
Kamou	2.51	
Yaroo	2.65	
Akha	2.59	
Hmong	3.10	
Others	2.40	
Occupation		2,819.83***
Unemployed	1.91	
Employed	2.55	
Electricity		2,607.37***
Do not use electricity	2.65	
Use electricity	2.09	
Water source		1,095.82***
Do not use good water source	2.56	
Use good source of water	2.19	
Province		458.06***
Phongsaly	2.33	
Xiengkhuang	2.66	
Champasak	2.25	
Place of Residence		2,141.86***
Rural	2.49	
Urban	1.86	

*** P_≤0.001

4.2.2 Mean of Children Ever Born of Women by Educational Level and Age Groups

To illustrate the relationship between fertility of women by educational level and age groups, Figure 3 presents the average number of children ever born of women by age group. It has been observed that the average numbers of cumulative fertility of women of every educational level increases when the age of women increases. Moreover, it is also shown that the fertility level of women is lower when their educational level is higher. The women who have no education have the highest mean number of children ever born. Women who have upper secondary education have the lowest mean of children ever born.

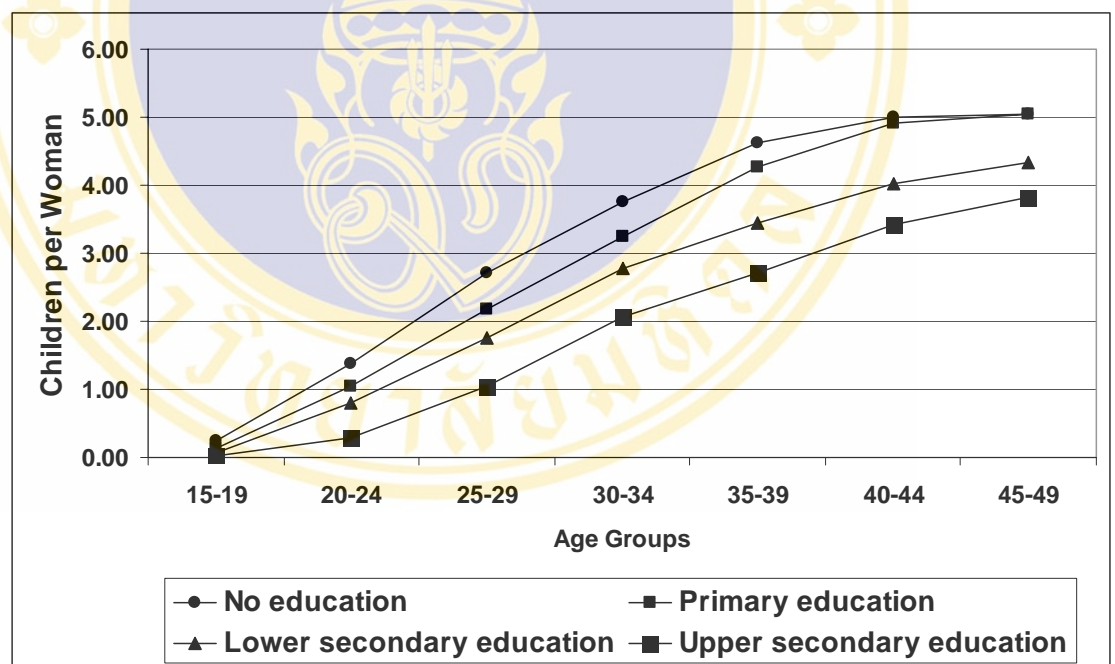


Figure 3. Mean of Children Ever Born of Women by Educational Level and Age Groups.

4.2.3 Percent of Women Distributed by Educational Level and group of Cumulative Fertility

Table 5 presents the percentage of women distributed by cumulative fertility. The large proportion of women with no children is found among women who have lower and upper secondary education. The women who have 7 and more children are likely to be women who have no education and primary education. The women with lower secondary education and upper secondary education; their proportion by cumulative fertility is quite similar; where the majority are in the group of no children and lowest in the ten and over children.

Table 5. Percentage of Women Distributed by educational level and Group of Cumulative Fertility

Formal education level	Cumulative fertility					Total
	No children	1-3	4-6	7-9	10+	
No education	25.60	34.89	26.73	10.00	2.79	100.00
Primary education	32.46	35.38	23.08	7.51	1.57	100.00
Lower secondary education	43.73	38.11	15.78	2.14	0.25	100.00
Upper secondary education	66.43	26.37	6.23	0.86	0.10	100.00
Total	36.46	34.79	20.84	6.43	1.48	100.00

Chi-Square = 18156.7; df=12, P≤ 0.001

4.3. Multivariate Analysis

4.3.1 Effect of Women's Education on Cumulative Fertility

In order to prove the hypothesis of this study; the ordinary least square (OLS) is used by taking all independent and control variables into the equation. Table6 presents the result of multivariate analysis of formal education's effects on cumulative fertility with having other geographic, demographic and socio-economic characteristics of women as controlling variables. R-square represents the variation of all independent variables and control variables in the model or on the cumulative fertility. R-square for the total level is 0.558, Phongsaly is 0.508, Xienkuang is 0.628 and Champasak is 0.549; all of the models are significant at 0.001.

The coefficient represents the effect of each independent variable on the dependent variable, for total level; education of women has significant negative effect on cumulative fertility. In primary education, the effect is -0.060 comparing to no education group, it means that the primary educated women when comparing to uneducated women; their cumulative fertility is 0.060 lower than uneducated women. However, the lower education level has lower effect comparing to women with higher level of education like lower secondary education which is -0.238 and upper secondary education which is -0.280.

Comparing among provinces, the effects of education level on fertility in Phongsaly province is -0.053 from primary education, -0.203 is from lower secondary and -0.239 is from the upper secondary education. In Xiengkhuang province, it is -0.242 from primary education, -0.469 is from lower secondary education and -0.480 is from the upper secondary education. And for Champasak province; the effect is -0.055 from primary education while -0.192 and -0.251 are from lower secondary and upper secondary education respectively. It has been observed that among these three provinces; in Xiengkhuang province the effects of women's education level on cumulative fertility is the highest while the lowest effect is found in Champasak. The reason of differential among these three provinces may be related to the growth rate of female of education in each province; on the other hand, in Champasak province the effects from socio-economic are more significant than in other provinces.

In Parallel with the effect of women's education level on fertility, the effects from other factors are also remarkable and important to be clarified. Marital status is used as one control variable in this study, it has been observed that the never married and divorced women have negative effects on cumulative fertility, for this study the never married fertility is used as the special observation and is not officially approved. Divorced women are affecting cumulative fertility comparing to widowed women, the reason to support this finding may be related to the chance and duration of staying in marriage is different. Divorcing may occur sooner than widowhood, most of women have more children before becoming widowed; it is different from divorcing which may be happened after marriage without children or with fewer children than widowhood. In Laos there is no specific kind of this study that could refer to.

Age of women is well known by other researchers in having a positive relationship with cumulative fertility and it is also consistent with this study that the age of women is supporting the cumulative fertility. In addition, the ethnicity is one factor that has positive relationship with cumulative fertility. Ethnicity for this study has been divided into six specific tribes: Lao, Khamou, Yaroo, Akha, Hmong and Others. From the result, it has been seen precisely that almost of ethnic women have positive effects on cumulative fertility comparing to Lao tribe; especially the Mhong tribe women which has the strongest effects on cumulative fertility for the whole size of women and all of them are significance at .001.

Place of residence is another factor that has effect on commutative fertility. In general urban women are found to have fewer children than those who live in the rural area (Retherford & Thapa, 2003). It is confirmed with this study. The reason that supports this finding is that, most women in the town can easily access to health service as well as family planning facility. They are more likely to be exposed to modernization, and information that makes them consider cost and benefit of having children. On the other hand in urban area (of these three provinces), most people have higher level of education than those who live in rural.

Socio- economic characteristics used in this study is occupation and household characteristic of women, employed women is found to have positive relationship with cumulative fertility in these three provinces; but for other socio-economic characteristic of women like such as household material and household characteristics are found significantly to have negative impacts on cumulative fertility for these three provinces. In addition, the result has also indicated that women who have owned agriculture land are found to have more children than those who have no agriculture land.

Table 6. Coefficient of Women's Education Level and Other Factors on Cumulative Fertility by Provinces

Independent Variables	Total	Phongsaly	Xiengkhuang	Champasak
Formal Education level				
No education ®				
Primary education	-0.060***	-0.053*	-0.242***	-0.055***
Lower secondary education	-0.238***	-0.203***	-0.469***	-0.192***
Upper secondary education	-0.280***	-0.239***	-0.480***	-0.251***
Marital status				
Widowed women ®				
Never married	-0.624***	-0.220**	-0.261***	-0.854***
Married women	0.883***	1.171***	1.054***	0.754***
Divorced women	-0.668***	-0.182*	-0.528***	-0.808***
Age of women				
Age	0.140***	0.125***	0.170***	0.132***
Ethnicity				
Lao ethnic ®				
Khamou ethnic	-0.038*	0.024	0.347***	0.330
Yaroo ethnic	0.371***	1.551	-0.558	0.371***
Akha ethnic	-0.024	0.275***	-0.689	0.043
Mhong ethnic	0.854***	0.955***	0.660***	-0.052
Other ethnic	-0.041***	0.013	0.200***	0.161***
Place of residence(of three provinces)				
Rural ®				
Urban	-0.153***	-0.254***	-0.342***	-0.037***
Occupation				
Unemployed ®				
Employed	0.060***	0.135***	0.152***	0.046***
Household characteristics				
Good type of roof	-0.077***	0.009	0.007	-0.074***
Good type of wall	-0.083***	0.020	-0.047	-0.145***
Good type of floor	0.197***	-0.017	0.071**	0.186***
Use electricity	-0.144***	0.001	-0.059**	-0.160***
Use good source of water	-0.005	-0.036	-0.118***	-0.041***
Use toilet	-0.228***	-0.085**	-0.104***	-0.275***
Use good energy for cooking	-0.145***	-0.299*	-0.061	-0.099***
Own agriculture land	0.042***	0.162***	0.117***	0.093***
N	214,474	34,981	48,783	130,710
R2	0.558***	0.508***	0.628***	0.549***

® = Reference Category; * P≤ 0.05; ** P≤ 0.01; *** P≤ 0.001

4.4 Discussion

4.4.1 Women's Education Effects on Fertility

Women's status is a key factor in determining the role of women in their family; as well as the decision making in the reproductive role. Education of women is one indicator that widely used as an indicator for women's social status. Women's education affect the supply, demand and fertility regulation of women (Mason, 1987; Nation & Division, 1995). Education makes women can access to more information, have better skills and authority which supports the women to be able to organize their life; especially with marriage, breast feeding, awareness of prenatal care, as well as related reproductive behaviors.

The analysis has confirmed the hypothesis that education of women has negative effect on fertility level. It confirms the previous studies that the higher education attention of women, the lower fertility. The result shows that as the level of education increase the proportion of cumulative children is decreased and this finding is consistent with Jain, (1981) and Pradhan, (1993). High fertility is found in the women who have no education while women who have education have lower fertility; especially the high education, the finding of this study is consistent with the neighboring country like Cambodia where the fertility is high in uneducated women (Poch, 2004). Education level of women is found to have negative impact on cumulative fertility in all these three provinces. The findings are consistent with a study found in Ghana (Tawiah, 1984) and in Latin American Countries (Jain, 1981a; Martin, 1995; Martin & Juarez, 1995).

Education Level of women is negatively affecting fertility in this study, the explanation to support this result is that women's education may influence the supply, demand and fertility regulation and its cost of children (Mason, 1987). Education influence women's age at marriage (Martin, 1995); educated women postpones the marriage which means that the reproductive opportunity is reduced. Entering to marriage union late leads to shorter reproductive period. Therefore, this behavior directly affects the number of cumulative fertility (Gangadharan & Maitra, 2001). High rates of child mortality increases the demand for children; however women's autonomy and education decrease child mortality and increase child survival (Kravdal,

1983) and reduce the demand for children. Moreover, educated women are more likely to have fewer ideal numbers of children than uneducated women (Martin, 1995).

Value of children is high among educated women due to the economic cost of children and make women want to limit number of children (Caldwell, 1980; Ho, 1979). Educated women are more likely to involve in the employment and the good opportunity to earn more income. If they have more children they may miss this chance (Kyriazis & Henripin, 1982); therefore fewer children is beneficial for them. In addition, educated women are more likely to use contraceptive than uneducated women (Shapiro & Tambashe, 1994), education increase the right perception in term of reproductive behaviors, education makes women knowledgeable. Educated women are less prone to have fatalistic attitude toward life and to accept the unpredictability of unregulated fertility. In many traditional societies, where contraception is not a socially sanctioned practice, education plays an important role in enabling women to engage in the new pattern of behaviors (Martin, 1995).

The effects of women's education when compared by provinces, in Xiengkhuang province the effect of women's education is higher than other two provinces. With better growth rate of female literacy since 1995 to 2005 it may support the high effect of female education in influencing the reproductive behaviors in this province. On the other hand in year 2000, this province had better rate of contraceptive use which may support the decline in fertility; however in this study the contraceptive variable is not available.

4.4.2 Other Covariates' Effects on Cumulative Fertility

Living in urban area is found to have negative effect on fertility, women who live in the rural area have more children than urban women (Retherford & Thapa, 2003; Sisouphanthong et al., 2000). Most of women in the town are more likely to expose to health service as well as family planning facility, modernization and information. They can see the benefit of having fewer children. Socio-economic characteristics of urban residence is generally better than in rural. Moreover, women with good economic status are more likely to use contraceptive (Ahmed, 2006). Women who live in urban area are more likely to use contraception (Retherford & Thapa, 2003) than women who live in rural area. On the other hand, rural women are

more likely to marry earlier than in urban area (Zarate, 1967), this situation is quite common in Laos. The custom of marriage in Laos, groom is supposed to move to live in the parent in law's house. Parents in rural area may maintain the old traditional culture that they may want the son in law to help in term of income generation and lead their daughters in the house occupying. Daughters who have no chance to study may marry earlier. Daughters are supposed to take responsibility in caring the older parents after the marriage. This behavior may commonly happen with the family who have no sons and have only daughters; especially the family who have only one daughter and the family that one of parents had passed away.

Ethnicity is one important factor that explains variation in fertility level. The result shows strong effect on cumulative fertility; especially Hmong ethnic women which is similar to hill tribe in Thailand (Leamsuwan, 2003); the explanation to support this is their culture and belief, and the place of residence. Different ethnicity may lead to have differentials in the culture. In some culture, women are likely to enter into marriage earlier and want to have as many children as the god could give them. And some of the culture, people want to have many children so they can help parents in the agriculture work. However, most of ethnic people live in the rural area and sometime live in the remote area where the information and health care service is not accessible. Because the information is important, the communication is the basic tool of information transferring, but some area that is far and hard to get in, the people are likely to be blind of information. They may have been sunk into the old and incorrect belief. In addition, education level of ethnic women is low (Leamsuwan, 2003; Prasithrathsint, 1985). As it has been discussed earlier, education is the factor that determine fertility level of the women, if proportion of women who have education is low, it means that those areas the high fertility will be happened. Moreover, the socio-economic status of ethnic women are also lower than other ethnic group that live in urban (Wong & Meng, 1985). Because socio-economic is another factor that determine the fertility level, socio-economic characteristics of women influence the reproductive behavior like the age at first marriage and contraceptive use (Coale, 1992; Shapiro & Tamashe, 1994).

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Objectives of this study are (1) to find out the level and patterns and compare the fertility among educated and uneducated women and (2) to test whether education of women influenced their cumulative fertility. The first objective has brought out an interested finding such as the proportion of women in the study is high among the primary and no education while lower secondary and upper secondary education covers 19 percent and 11 percent respectively. More than half of women are currently married; most of women live in rural area. In term of socio-economic characteristics, most of women are have good characteristics of socio-economic; however the unemployment rate is quite high, which is about two third of them are unemployed. The majority of women are Lao ethnic while other ethnic women are less than ten percent.

In order to support the first objective of the study, the average number of cumulative fertility and proportion of women by number of cumulative fertility is calculated. The finding shows that uneducated women have more number of children than educated women; the pattern however is consistent with literature that is “The higher education level the lower number of cumulative fertility”, it is the same pattern as the proportion of cumulative fertility by education level of women, the proportion is reduced when the education level of women increases.

Second objective is to find out the effect of women education level on cumulative fertility, multivariate analyses revealed that formal education level of women has significant negative relationship with their cumulative fertility, therefore the hypothesis is accepted. The effect is stronger when the education level of women is higher, the weaker effect is found in the women who have lower education level. On the other hand, the effects from other covariates are also negatively significant such as:

urban area and socio-economic characteristics of women, but positive effects are found from the ethnic women and the age of women. Women's education level is found to have negative impact on cumulative fertility; however as a part of the data analysis, the experimental test has implemented also for the current fertility, but the result look strange when compared to other study and has to be cut out from this study.

5.2 Policy Implication and Recommendation

According to the result of the research, the policy could be implicated as following:

1. Education of women is very important; education can help women to develop a right perception in term of family planning and reproduction. Autonomy of women is the result of education, and this social characteristic influence the reproductive behaviors and lead women to have low fertility. Therefore the opportunity for education of women should be improved and supported. Women should be supported to study as much as possible and at least to complete the formal education system of government.
2. Ethnicity is another factor that makes high fertility in the country; therefore the policy makers should look for a policy to influence their attitude towards the fertility and related behaviors such as using contraceptive. The possible recommended program could be the educational program to improve their knowledge and make them be aware of negative impact of high fertility.
3. Women in rural are found having more children, Government should consider the education and health outreach program to the rural; especially the remote areas; where the education and health condition is low. And the alternative resolution is to improve the road infrastructure in rural area to enable women to get more information and familiar with any contraceptive methods.
4. In addition, socio-economic characteristic of women is found having negative relationship with cumulative fertility; therefore socio-economic development is also important if Government want to bring down the growth of population.

5.3 Future Research Recommendation

In the future study, the data source for this kind of study should be sufficient in term of the reproductive issues such as the information that can support the intermediate variable of fertility like, age at first marriage, breast feeding, postpartum, desired number of children or ideal family size and contraceptives which are very important variables for this study. Beside the information on reproductive issue; variables regarding to the measurement of the economic status of the women or their family like: income or wage per month and expenditure consumption is also necessary. On the other hand the quantitative is a good approach in the fertility study; however in term of additional logical explanations on the issue of fertility regulation and the demand of fertility and the supply of family the qualitative approach is also needed. The future study on fertility should also address the impact of the program like the mass media program which is a potential tool in persuading people in their reproductive behaviors.

BIBLIOGRAPY

- Ahmed, M. U. (2006). Married Female Adolescents' Reproductive Health Behavior in Bangladesh: Evidence from Demographic and Health Survey. *Population and Reproductive Health Research. Faculty of Graduate Studies, Mahidol University*, pp.49-50.
- Akin, J., Bilsborrow, R., Guilkey, D., Popkin, B. M., Benoil, D., Cantrelle, P., et al. (1981). The Determinant of Breast-Feeding in Sri Lanka. *Demography*, Vol. 18, No. 3.
- Anderson, J. E. (1975). The relationship between change in Educational Attainment and Fertility Rate in Taiwan. *Studies in Family Planning*, Vol.6, No. 3, 72-81.
- Breierova, L., & Duflo, E. (2004). The Impact of Education on Fertility and Child Mortality: Do Father Really Matter Less Than Mothers? *NBER Working Paper, No. 10513*.
- Bulatao, R. A., Lee, R. D., Hollerbach, P. E., & Bongaarts, J. (1983). Determinants of Fertility In Developing Countries. *Studies in Population, Vol. 1 Supply and Demand for Children*.
- Bureau, P. R. (2006). World Population Data Sheet.
- Caldwell, J. C. (1980). Mass Education as a Determinant of the Timing of Fertility Decline. *Population and Development Review*, Vol. 6, No. 2, pp. 225-255.
- Coale, A. J. (1992). Age of Entry into Marriage and the Date. *Demography*, Vol. 29, No. 3.
- Committee, S. P., & Centre, N. S. (1997). Result of Population Census 1995.
- Education, M. o. (2005). Anaul Report 2004-2005.
- Espenshade, T. J., Kamenske, G., & Turchi, B. A. (1983). Family Size and Economic Welfare. *Family Planning Perspective*, Vol. 15, No. 6, pp. 289-294.
- Gangadharan, L., & Maitra, P. (2001). The Effect of Education on the Timing of Marriage and First Birth in Pakistan.

- Health, M. o. (1995). Birth Spacing Policy.
- Health, M. o. (2005). Reproductive Health Policy.
- Ho, T. J. (1979). Time Cost of Child Rearing in the Rural Philippines. *Population Research and Policy Review, Vol. 5, No. 4*, pp. 643-662.
- Housing, S. C. f. C. o. P. a. (2005). Result from the Population and Housing Census 2005.
- Ikamari, L. D. E. (2005). The effect of education on the timing of marriage in Kenya. *Demographic Research, Vol.12*, pp1-28.
- Jaime, J. G. (2006). Factors Influencing Filipino Couples' Desired Family Size and Contraceptive Use In the Philippines. *Thesis, ISBN-974-04-7560-4*.
- Jain, A. K. (1981a). The Effect of Female Education on Fertility: A Simple Explanation. *Demography, Vol. 18, No. 4* pp. 577-595.
- Jain, A. K. (1981b). The Effect of the Female Education on Fertility: A Simple Explanation. *Demography, Vol. 18, No.4*, 577-595.
- Johnson-Hanks, J. (2003). Education, Ethnicity and Reproductive Practice in Cameroon.
- Knodel, J., & Wongsith, M. (1991). Family Size and Children's Education in Thailand: Evidence from a National Sample. *Demography, Vol. 28, No. 1*, pp. 119-131.
- Kravdal, O. (1983). Child Mortality in India: Individual and Community Effects of Women's Education and Autonomy.
- Kyriazis, N., & Henripin, J. (1982). Women's Employment and Fertility in Quebec. *Population Studies, Vol. 36, No. 3*.
- Leamsuwan, T. (2003). Fertility of Minorities in Thailand. *Population and Social Research. Faculty of Graduate Studies, Mahidol University*.
- Martin, T. C. (1995). Women's Education and Fertility: Result from 26 Demographic and Health Surveys. *Studies in Family Planning, Vol. 26, No. 4*, pp. 187-202.
- Martin, T. C., & Juarez, F. (1995). The impact of women's education on Fertility in Latin America: Searching for Explanation. *International Family Planning Perspectives, Vol.21, No. 2*, pp. 52-57+80.

- Mason, K. O. (1987). The Impact of Women's Social Position on Fertility in Developing Countries. *Sociological Forum, Vol. 2, No. 4*, pp. 718-745.
- Muhuri, P. K. (1995). Health Programs, Maternal Education, and Differential Child Mortality in Matlab, Bangladesh. *Population Research and Policy Review, Vol. 21, No. 4*, pp. 813-834.
- Nath, S. R., & Hadi, A. (2000). Role of Education in Reducing Child Labour: Evidence from Rural Bangladesh. *Research and Evaluation Division, BRAC, 75 Mohakhali, Dhaka 1212, Bangladesh*.
- Nation, U., & Division, P. (1995). Women's Education and Fertility Behaviour.
- Omariba, W. R. (2003). Women's Educational Attainment and Intergenerational Patterns of Fertility Behavior in Kenya. *Discussion Paper No. 03-11*.
- Park, C. B., Isam, M. A., Chakraborty, N., & Kantner, A. (1998). Partitioning the Effect of Infant and Child Death on Consequent Fertility: An Exploration in Bangladesh. *Population Studies, Vol. 52, No. 3*, pp. 345-356.
- Poch, B. (2004). Multilevel Analysis of Current Fertility in Cambodia.
- Pradhan, H. (1993). A Study on the Determinants of Fertility in Nepal. *Population and Social Research, P. 48-51*.
- Prasithrathsint, S. (1985). Ethnicity and Fertility in Thailand. *Research Note and Discussion Paper, No. 51*.
- Retherford, R. D., & Thapa, S. (2003). Fertility in Nepal, 1981-2000: Level, Trend, and Component of Change. *Population and Health Series, No. 111*.
- Richter, K., Weide, R. V. d., & Souksavath, P. (2005). Lao Poverty Trend 1992/93-2002/03.
- Shapiro, D., & Tambashe, B. O. (1994). The Impact of Women's Employment and Education on Contraceptive use and Abortion in Kinshasa, Zaire. *Studies in Family Planning, Vol. 25, No. 2*, pp. 96-110.
- Sisouphanthong, B., Xaovana, V., Louangvixia, B., & Chanthalanouvong, T. (2000). Lao Reproductive Health Survey.
- Tawiah, E. O. (1984). Determinants of Cumulative Fertility in Ghana. *Demography, Vol. 21, No. 1*, pp.1-8.

Wong, A. K., & Meng, N. S. (1985). Ethnicity and Fertility in Southeast Asia.

Research Note and Discussion Paper, No. 50. Institute of Southeast Asian Studie.

Zarate, A. O. (1967). Some Factor Associated with Urban-Rural Fertility Differential in Mexico. *Population Studies, Vol. 21, No. 3, pp.283.293.*



BIOGRAPHY

NAME	Mr. Vilon Viphongxay
DATE OF BIRTH	December 04, 1977
PLACE OF BIRTH	Simmano Village, Vientiane Capital, Lao PDR
INSTITUTION ATTEND	Faculty of Social Science and Humanity, National University of Laos, Lao PDR Bachelor of Arts in English Language, Special Course 1995-1999 Institute for Population and Social Research, Mahidol University, Thailand Master of Arts (MA) in Population and Reproductive Health Research 2006-07
SCHOLARSHIP	Statistic Sweden Project, National Statistics Centre, the Committee for Planning and Investment
HOME ADDRESS	Simmano Village, Hatsaifong District Vientiane Capital, Lao P.D.R Tel: +856-20-5700-759 Email address: laostaffs@yahoo.com meefaenleo1@yahoo.com laostat@hotmail.com
EMPLOYMENT ADDRESS	National Statistics Centre, the Committee for Planning and Investment Luangprabang Road, Sithaneua Village, Vientiane Capital, Lao P.D.R Tel: +856-21-214-740 Email: nscp@etllao.com