Fertility decline among the Karen and the Hmong, hill tribe minorities in Northern Thailand

INTRODUCTION

Differentials in fertility transition are observed in many western countries during the nineteenth century and later in many less developed countries. There are differences and similarities in explaining fertility transition between these two periods (Kirk, 1996). Nowadays, many countries both more developed and less developed countries have reached replacement or below replacement fertility level. Fertility in Thailand declined very rapidly (Knodel, Chamratrithirong and Debavalaya, 1987) and reached below replacement level of fertility by the year 2000 (National Statistical Office (NSO) 2003). The major factors leading to rapid fertility decline in Thailand are social and economic change, latent demand for effective and acceptable means of fertility control, and orgainised family planning program. The predominance of cultural homogeneity is considered an important aspect of the Thai setting that facilitated reproductive change (Knodel, Chamratrithirong and Debavalaya 1987).

The vast majority of Thai population shares a common language, religion and ethnicity (Knodel, Chamratrithirong and Debavalaya 1987). However, when the focus is shifted to the regional level, cultural differences become more pronounced, especially in the South where most of the Muslim minority live and in the northwestern part where hill tribe minorities with distinct ethnic, linguistic and religious identities live. The linkages between religion, ethnic and cultural identity, and political setting has been discussed extensively to explain reproductive patterns among the Muslims (Knodel et al. 1999).

Few analyses have been directed, however, at fertility of the hill tribes. Most of these earlier studies rely on a small population, mainly due to large-scale data being previously unavailable (Soottipong 1995). This study, therefore, aims at examining whether this model of explaining fertility decline in Thailand can work out once it shifts to the hill tribe minorities utilising the 1990 and 2000 Population and Housing Censuses.

The hill tribe populations, the Karen and the Hmong

Patterns of fertility behaviour have varied among minority groups in various socioeconomic and cultural categories within countries and different countries in many parts of the world. These minorities can be classified into two major groups in terms of their integration into broader society. The first group are those who are highly integrated physically, socially, and economically with the majorities. Some groups of this kind are immigrants, for instance Blacks, Jews, Japanese Americans, and Catholics in the United States (Goldscheider and Uhlenberg 1969), Catholic and non-Catholic minorities in Australia (Day 1984), Chinese and Japanese in Canada (Halli 1987), Catholics, Protestants, Jews, and those of no religious affiliation in the United States (Goldscheider and Mosher 1988), the Korean minority in China (Park and Han 1990), and Muslims in Southern Thailand (Knodel et al. 1999).

The second group are the minorities who live in isolation from the mainstream of life of the majorities. Most of these minorities are indigenous populations. These minorities include Maori population in New Zealand (Pool 1977, 1985), !Kung in Botswana (Howell 1979), Alaskans in the United States (Blackwood 1981), Canadian Aborigines (Romaniuk 1981, 1987, 1993), Aborigines in Australia (Gray 1983), minority groups in China (Hechiang et al. 1984),), Ainu in Japan (Hammel 1988), Amish in North America (Wasao et al. 1996) and hill tribe populations in Thailand (Soottipong 1995).

Hill tribe populations in Thailand consist of nine major ethnic groups: the Karen, Hmong, Lahu, Akha, Lua , lisu, Yao Khamu and Htin. The hill tribes constitute about one percent of the total Thai Population. Each tribe has its own language, customs, religion and socioeconomic organisation. Most have been, to some extent, isolated geographically, socially, economically, culturally, and politically from the mainstream way of life in Thailand. The largest group is the Karen who constitutes about half of the hill tribe populations, followed by the Hmong.

Table 1. *Hill Tribe Populations by Ethnic Group, 1990, 2000*

Year	Karen	Hmong	Lahu	Akha	Lua	Lisu	Yao	Khamu	Htin	Total
1990	189,051	50,497	39,177	19,519	14,423	13,762	20,269	3,524	1,026	351,248
	53.8	14.4	11.2	5.6	4.1	3.9	5.8	1.0	0.3	100.0
2000	350,956	130,586	78,886	59,554	32,996	25,643	23,458	7,650	2,590	712,318
	49.3	18.3	11.1	8.4	4.6	3.6	3.3	1.1	0.4	100.0

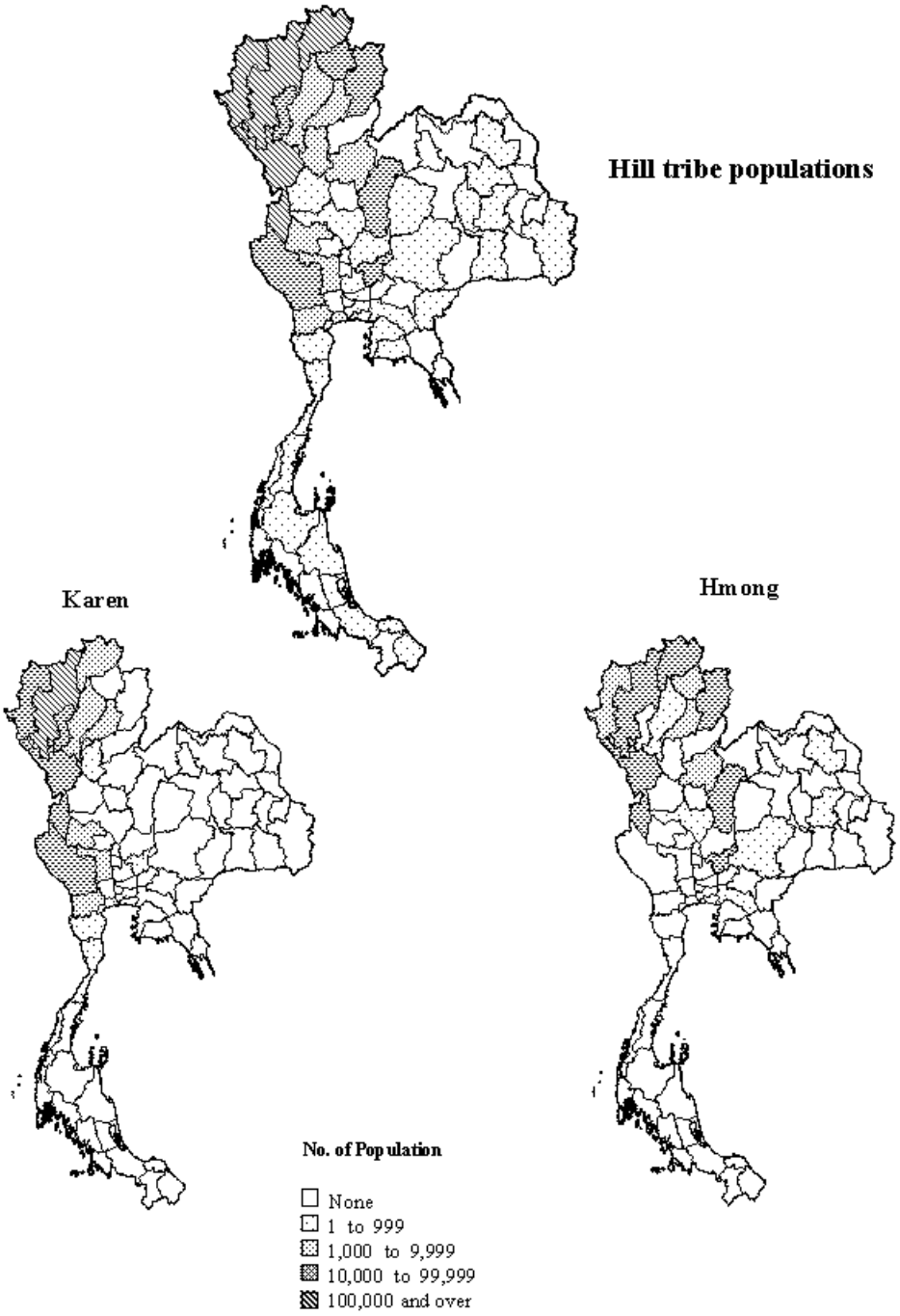
Sources: The Population and Housing Censuses, 1990 and 2000.

Almost all the hill tribes are engaged in the agricultural sector or a form of shifting cultivation (Geddes 1967; Tribal Research Institute (TRI) 1989). The hill tribes can be classified in terms of their agricultural pattern into the tribes with a tradition of opium poppy growing and the tribes which do not traditionally grow opium poppies. The Hmong, Yao, Lahu, Akha, and Lisu are regarded as tribes who traditionally cultivated the opium poppies. These ethnic groups used to practice shifting cultivation resulting in periodic soil exhaustion, and cycle movement from place to place to look for new land. The remaining hill tribe groups – the Karen, Lua, Htin, and Khamu – are tribes who do not traditionally grow opium poppies. These groups usually have more stabilised residence than the opium poppy growing tribes. However, all of the hill tribe groups also raise animals, practice wet- rice cultivation, and plant orchards wherever there is sufficient water for irrigation.

Generally, the households of hill tribes consist of two types of family: the nuclear and the extended family (TRI 1989). The nuclear family is common among the Karen, Lahu, Lisu, Akha, Lua, Htin and Khamu. These groups are monogamous. Extended families are common among the Hmong and Yao, which are polygynous ethnic groups. The Lua are the group most integrated into Thai society (Bradley 1989). Strong son preference is a characteristic supporting high fertility of the tribes who traditionally grow opium poppies (Kunstadter et al. 1987).

The Karen are found in Thailand and Myanmar (Hinton 1980). In Thailand, some Karen resided in the vicinity of the ancient city of Chiang Mai as early as the eight century A. D. (Coedes 1925) The Hmong live in southwestern part of China, northern part of Laos, Vietnam and Thailand. The Hmong migrated to Thailand between 1980 and 1990, and

they were found in Tak province in 1929 (Geddes, 1976; Mottin, 1980). After the communist period in 1975, some Hmong migrated as refugees to developed countries such as United States of America, France, Australia, Canada, Argentina and Germany (Leeprecha 2001). The distribution of the hill tribes, the Karen and the Hmong in Thailand is presented in Map 1.



Map 1: *Provinces of Total Hill Tribe Populations, Karen and Hmong : 2000*

Source: 2000 Population and Housing Census

Contact with outsiders

The hill tribes have been in a process of change resulting from contact with outsiders. A major source of change has been activities of the Thai government since the 1950s (TRI 1989). There is no government policy towards any specific hill tribe group (Bhruksasri 1989). The government adopted a nation building policy to integrate the hill tribes into Thai society. Buddhism, the religion of most Thai, was propagated and schools in which teaching is in Thai were established in the hill tribe area. The teaching in schools was not only about normal skills of primary education but also about the Monarchy, the nation, and Buddhism which is a regular part of the Thai public school curriculum (Kammerer 1989; Kunstadter 1983; Manndorff 1967). Buddhist missionaries started to work in the hill tribe area in 1955 (TRI, 1991). Christian missionaries, however, began to work with tribal peoples earlier than any other organisations (Kunstadter 1967). The first Protestant missionary went to work with the hill tribes in Chiang Mai in 1867 (Wells 1958). Basically, the hill tribes are animists who believe in spirit of all kinds. However, many of them are converted to Buddhists and Christians.

The conversion from animism to Buddhism or Christianity can be regarded as a process of adaptation among the Karen and the Hmong to the outside world, partly due to the intervention of the Thai State and the missionaries. The main reason for converting is that they do not have to practice sacrifice and to become Christian they can have scholarship for further study in town and get modern medical treatment. (Soottipong et al. 1998; Chuengsatiansup and Pinkeaw 2003). Buddhism as the stated religious belief may be important in terms of indicating the degree of self-identification of being a Thai and greater integration into Thai society among the Karen (Soottipong et al. 1998) and probably among the Hmong.

It was not until 1976 that a policy to restrict the utilisation of land was introduced (TRI 1989). Increasing restriction by the Thai government on practicing shifting cultivation has resulted in a more fixed pattern of settlement. Government agencies began to provide family planning services in the hill tribe areas beginning in the 1970s (Kunstadter et al. 1987).

Theoretical perspectives

Reproductive behaviour of the Karen and the Hmong is seen as influenced by increasing contact with outsiders including the introduction of various intervention programs of government and non-government organisations, especially the nation building policy on education and religion. With improved transportation, increase in tourism, market economy and restriction of land use some hill tribes have shifted from their traditional agriculture to paid employment. All these factors are hypothesised to result in the change in their reproductive attitude and behaviour.

Empirical findings show that an important factor contributing to fertility decline is an increase in the educational attainment of the adult female population (Shapiro 1996). Two often explanations are provided. First, education of women results in delaying marriage and first birth. Secondly, education attainment increases the status of women (Cassen 1976).

The role of education in fertility decline can be interpreted differently in multicultural societies with linguistics diversity. Watkins (1991) identified schooling as the most important of nation building, particularly due to the enforcement of a national language or languages in countries having more than one as the medium of instruction in schools. Ideational explanations of fertility change may play a role through the diffusion of new ideas of family norms or new contraceptive techniques among those who speak the same languages. It seems to suggest that those who are more integrated into social networks that are favorable to control fertility tend to have lower fertility. However, what mattered are changing attitudes and behaviour of sub-national populations or minorities in nation states and the speed in which it spread in a specific culture or cultures.

According to minority status hypothesis, the insecurities of a minority group lead them to limit family size to facilitate social mobility, provided that the group seeks both acculturation and social and economic mobility, and the minority group does not have a

strong pronatalist ideology or one that specifically discourages birth control. In contrast if acculturation is not designed and the group feels economically or politically disadvantages, minority status may encourage high fertility to ensure group preservation and strength in numbers (Goldscheider 1971).

The role of the state in promoting not only social interaction or diffusion through linguistic homogeneity but also market integration is emphasized as the main determinant of fertility decline (Watkins 1991). Increasing market integration results in change in economic base of local community, normally from agrarian root to non-agriculture base. Fertility tends to decline when non-agriculture occupation increases (Caldwell 1982). There are two main explanation for this evident. First, it is argued that as children contribute less to the farm labour requirement, the parents' motivation to have a large number of children is reduced. Secondly, non-agriculture work removes individuals from their families and provides an opportunity for exposure to new ideas and values that may legitimize the practice of fertility limitation, or create new goals that are not compatible with large families (Axinn 1992).

DATA AND METHODS

Data sources

The present study is based on micro data samples of the 1990 and 2000 population censuses in Thailand. Since the population under study is minorities, the sample size of micro data needs to be large enough to give reliable results. The sample sizes used are 20 percent of the 1990 and 2000 censuses (all records from the long form questionnaire). For the Thai and Northern Thai, 1 to 1.2 percent of the 1990 and 2000 censuses are used.

The 1990 and 2000 population censuses identify members of Thai hill tribe minorities by language usually spoken in the households, including use of both Thai and the hill tribe languages.[1] People speaking only the hill tribe languages are also identified. It is unlikely that in general the Thai speak languages other than Thai at home. The question on

languages spoken at home is asked at the household level, and this variable is assigned to all household members. People who do not usually speak the language of their hill tribe group may be enumerated but remain unidentifiable as members of their ethnic group. Those who usually speak hill tribe languages might also include some people of Thai or other ethnicity.

Measures

Our estimates of levels of fertility are based upon the Palmore Regression method (Palmore 1978). The Palmore method estimates total fertility rate (TFR) from ratios of children of age 0-4, 5-9, and 10-14 to total population, ratios of the same age group of children to women ages 15-49, percent of ever-married women ages 20-24, 25-29, 35-39 and 45-49, median age of first marriage of women and a measure of mortality (infant mortality rate (IMR)). Infant mortality rates of the Northern Thai from series of the Surveys of Population Change carried out by the NSO (1964-1965, 1974-1976, 1985-1986, 1989, 1992 and 1995-1996) with some interpolation to make it consistent with the census periods are used. This is because the IMRs of hill tribe populations are not available.[2] This Palmore method does not assume stable population and is not sensitive to infant mortality which is appropriate for fertility estimation of the hill tribes. The TFR from this method refers to an average of 7.5 years prior to the census.

Multiple linear regression is employed for the analysis of factors affecting the change in fertility of ever-married Karen and Hmong women age 15-49 years. Since we use data both from population and housing files, matching these two files are carried out. In the 1990 census almost all records can be matched, but in the 2000 census about 88 percent of the Karen and 70 percent of the Hmong can be matched. Unmatched records are excluded from the analysis. The data sets from two years are pooled. We deflate the sample weights so that the number of weighted observations equals the number of actual observations. For ever-married women aged 15-49, there are 5,720 Karen and 1,476 Hmong in the 1990 sample and 11,303 Karen and 2,826 Hmong in the 2000 sample included in the analysis. Unknown values are excluded from the analysis on a variable by variable basis. However, the variations of unknown of variables used are small.

Number of children ever born is used as the dependent variable.[3] All independent variables, except age, are treated as categorical variables. The age squared term is used to control any curvilinear relationships, because the number of children ever born and the age of mother are not linearly related.

Religion

The original religion category includes 7 categories as follows: Buddhism, Christianity, Hindu, Confusion, Others and No religion. For the hill tribes there are systematic sizable number of Others and No religion between the two censuses. With personal communication with the NSO at the head office and some northern provincial offices where the hill tribes live, it is likely that the hill tribes who reported others and no religion were those who professed animism, the traditional religion of the hill tribes. These three categories are, therefore, combined into a category so called " animism".

Industry

The introduction of new standard classification of occupation in the 2000 census makes it impossible to compare occupation overtime. Therefore, industry is used in stead. The new standard classification of industry was also introduced in the 2000 census but the new and the old classifications are more or less compatible.

Wealth index

" Household possessions" refers to the ownership of items from a list of eleven modern goods. These are radio, fan, bicycle, television, refrigeration, washing machine, telephone, motorcycle, air-conditioner, ploughing machine and truck. The index is the sum of points scored by the household according to the following scheme: 1 point each for radio and fan, 2 points for bicycle, 3 points each for television, refrigeration, washing machine and telephone, 4 points each for air-conditioner, motorcycle, and ploughing machine and 6 points for truck. Allocation of points is based on approximate ordinal rank of their cost. The wealth index is grouped into three categories. A "low" level means no possessions while "medium" and " high" levels refer to index scores of one to five and more than five respectively.

FERTILITY DECLINE AMONG THE KAREN AND THE HMONG

Table 2 gives the total fertility rates (TFR) for the Thai, Northern Thai, hill tribes, Karen and Hmong between 1970s and 1990s.[4] It is evident that fertility was declining for all ethnic groups. Hmong fertility was the highest and considerably higher than the Karen, Thai and Northern Thai majorities. The finding was consistent with previous studies (Soottipong 1995). Hmong had the slowest fertility decline. In early 1990s Hmong women, on the average, had almost 3 children more than the Karen and about 4 children more than the Thai and Northern Thai.

Table 2. *Total fertility rates (TFRs) of the Thai[a], Northern Thai[a], hill tribes, Karen and Hmong*

Year	Thai	Northern Thai	Hill Tribes	Karen	Hmong
1975-1979	4.9	3.7	5.6[b]	5.5[b]	6.6[b]
1980-1984	2.7	2.3	5.6[b]	5.4[b]	7.1[b]
1982.5	2.7	2.3	4.3[c]	4.0[c]	6.6[c]
1985-1989	2.2	2.0	4.4[b]	4.1[b]	6.4[b]
1992.5	2.0	1.9	3.4[c]	3.2[c]	6.0[c]
% change					
1982.5 to 1992.5	-25.9	-17.4	-20.9	-20.0	-9.1
1975-79 to 1992.5	-59.2	-48.6	-39.3	-41.8	-9.1

Notes: [a] TFRs of the Thai and Northern Thai are from the 1974-1976, 1985-1986, 1991 and 1995-1996 Surveys of Population Change carried out by the National Statistical Office and referred to those periods.

[b] Based on the Own-children technique (National Statistical office 1997).

Source: The Population and Housing Census, 1990.

[c.] Based on Palmore's method. Own-children method cannot be applied to the 2000 census since there is no identification to match children and their mothers.

Sources: The Population and Housing Censuses, 1990 and 2000.

It can be seen from Figure 1, which presents age specific fertility rates of the Karen and Hmong between early 1980s and1990s, that fertility declined in all age groups. Fertility of women in the youngest (15-19) and oldest age group (45-49), however, declined almost to a negligible level. The Karen women experienced a shift in the age pattern of fertility, with women aged 20-24 having the highest fertility in early 1990s. For the Hmong, the highest fertility was at aged 20-24.

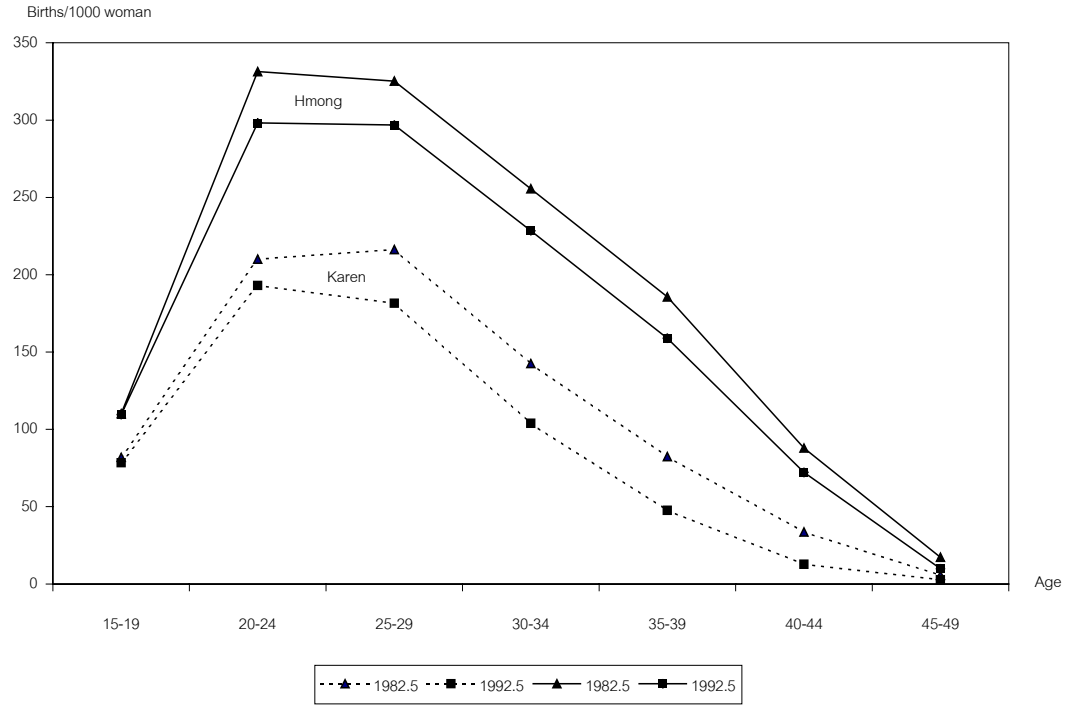


Figure 1. *Age specific fertility rate of the Karen and Hmong.*
Sources: The Population and Housing Census, 1990 and 2000

Several key socioeconomic indicators suggest that the higher fertility of the Karen and the Hmong compared with the Thai and Northern Thai was likely to be due to their earlier marriage and less practice of contraceptive use, lower socioeconomic status and household structure.

Table 3: *Key socioeconomic indicators of the Thai, Northern Thai, hill tribes, Karen and Hmong.*

	Year	Thai	Northern Thai	Hill Tribes	Karen	Hmong
Female singulate mean age at first marriage	1990	23.5	22.6	20.3	21.0	19.1
	2000	24.1	23.3	20.8	20.8	19.9
% contraceptive use	1990	66.7	69.8	38.1	37.7	27.7
	2000 [a]	73.5	79.1	NA [b]	NA [b]	NA [b]
% population in the agricultural sector	1990	66.8	75.4	84.7	84.6	85.9
	2000	56.3	63.1	70.6	72.0	66.7
Household size	1990	4.4	4.0	5.0	4.8	6.2
	2000	3.8	3.5	4.6	4.3	5.9
% households with sanitation [c]	1990	86.1	89.4	41.1	35.8	57.8
	2000	97.8	97.6	68.4	61.4	85.1
% households with safe drinking water [d]	1990	80.3	75.7	44.6	46.4	47.1
	2000	92.6	89.0	52.8	54.2	69.3
% households with radio	1990	81.3	80.6	48.5	41.2	69.6
	2000	76.7	77.2	44.0	37.9	59.1
% households with television	1990	67.9	65.3	6.5	4.4	8.6
	2000	90.6	88.7	27.4	20.7	40.1

Notes: [a] Percent current contraceptive of the currently married Thai and Northern Thai aged 15-49 is from the 1995-1996 Survey of Population Change
[b] NA = Not available
[c] Sanitary types of toilet include flush latrine or molded bucket latrine.
[d] Safe drinking water includes bottles drinking water, tap water, rain water or private well.
Sources: The Population and Housing Censuses, 1990 and 2000.

The Hmong women had the lowest age of marriage and the lowest rate of contraceptive use. Even though the Karen and the Hmong had much lower standard of living than the Thai, the situation of both ethnic groups was improved significantly over the 10 year period. The improvement in sanitation is generally related to mortality decline and consequently leads to fertility reduction as stated in the 'Fertility Transition Theory' (Kirk 1996). Previous studies show that this explanation is true for the Karen (Soottipong 1995), but not the Hmong. Fear of child death was infrequently mentioned as a motive for having more children (Kunstadter et. al. 1992).

Comparing between the Karen and the Hmong, socioeconomic development and standard of living of the Hmong improved more quickly than that of the Karen, but fertility of the Hmong declined at a much slower rate than the Karen.

The Hmong' s characteristics, which were the opposite of Karen's, that made Hmong fertility highest were probably due to their patrilineal society, strong son preferences and extended family. Based on the previous study, the Hmong had higher mean preferred family size (4.6 children) compared with the Karen (3.7 children) and the Thai (2 children) (Kamnuansilpa et al., 1987).

Between 1990 and 2000, the Hmong were more integrated into Thai society than the Karen as measured by education, speaking Thai and Buddhism. Education of the Hmong progressed remarkably for both boys and girls. The status of Hmong women, as manifested by education attainment, was improved significantly. It can be seen from Table 4 that the gender gap in compulsory primary education (6 years schooling)[5] and higher of the Hmong almost disappeared during the 10 year period. In 1990, only about 12 percent of Hmong women aged 15-19 completed compulsory primary school compared with about 47 percent of their men counterpart. In 2000, this level of education increased to over 80 percent for both males and females. We need to explore whether the change in education contributed to fertility decline among the Hmong.

Table 4: *Selected indicators of degree of integration into Thai society of the hill tribes, Karen and Hmong, 1990 and 2000.*

	Year	Thai	Northern Thai	Hill tribes	Karen	Hmong
% Population aged 15-19 with 6 years schooling and over						
Both sexes	1990	88.9	83.6	29.7	26.3	29.6
Males		89.1	84.2	35.6	26.7	47.3
Females		88.6	83.0	24.8	25.9	12.0
Both sexes	2000	95.3	91.2	54.2	50.4	85.4
Males		95.3	91.2	59.5	55.5	86.7
Females		95.4	91.2	47.9	44.5	83.8
% Population aged 15 years and over speaking Thai						
Both sexes	1990	*	*	45.7	43.8	39.1
Males		*	*	46.7	45.3	40.3
Females		*	*	44.7	42.2	37.9
Both sexes	2000	*	*	67.9	60.2	91.4
Males		*	*	68.1	61.0	90.8
Females		*	*	67.6	59.4	92.0
% Buddhists	1990	94.6	97.3	63.8	77.3	75.6
	2000	94.6	97.7	83.7	87.9	93.9

Note: * The Thai language is their mother tongue.
Sources: The Population and Housing Censuses, 1990 and 2000.

FERTILITY DIFFERENTIALS WITHIN THE KAREN AND THE HMONG

Our earlier findings show that fertility decline among the Thai majority spreads across linguistic boundaries to the hill tribes, Karen and Hmong even though their socioeconomic conditions are less favourable. Since changing fertility behavior does not occur to individuals simultaneously, our next step is to investigate fertility differentials with the two ethnic groups.

MULTIVARIATE ANALYSIS

Tables 5 and 6 show the results of regression analysis of the number of children ever born from the pooled data sets of 1990 and 2000 censuses of the Karen and the Hmong respectively. The analyses of dynamics of underlying changing of patterns of fertility differences by socioeconomic characteristics were conducted with 4 Models as shown.

The Karen

When compared to 1990, the findings confirm that fertility of the Karen declined during 1990-2000. The coefficient of year increases after controlling for age and social integration variables (ability to speak Thai, religion and education) and somewhat decreases after including additional variables which represent migration status, working activities, economic status or geographical variables. These results indicate that the decrease in number of children ever born of ever-married Karen women aged 15-49 is the result of changing composition of the population in terms of socioeconomic, migration status and geographical composition.

Regarding religion, holding the other variables constant, the Karen who were Buddhist had the lowest fertility, about 0.04 fewer children than those who were Christian. Fertility of the Karen who were animists was in the middle. The findings may reflect the self-identification of being Thai rather than their religious belief. The highest fertility among the Christian Karen may be due to Karen nationalism promoted by the Catholic Church (Soottipong, Lucas and Gray 1998).

Relative to Karen women with no education, those with some schooling (mainly primary school) had about had 0.07 fewer children.

Model 4 document the significance of changing composition of working activity and level of wealth on fertility of the Karen. Karen women engaged in the non- agricultural sector, relative to those in the agricultural sector, had lower fertility, and those with

highest level of wealth, relative to those with lower levels of wealth, had the lowest fertility.

Table 5. *Multiple regression of factors affecting fertility of ever- married Karen women aged 15-49, 1990 and 2000*.

Predictor variables	Model 1	Model 2	Model 3	Model 4
Year				
1990	---	---	---	---
2000	-0.105 ***	-0.127 ***	-0.119 ***	-0.112 ***
Age		1.084 ***	1.046 ***	1.094 ***
Age square		-0.612 ***	-0.592 ***	-0.635 ***
Speaking Thai in Household				
Not speak Thai			---	---
Speak Thai			-0.012	-0.007
Religion				
Christianity			---	---
Buddhism			-0.046 ***	-0.042 ***
Animism			-0.016 *	-0.015 *
Education				
No education			---	---
Some education			-0.082 ***	-0.071 ***
Migration in 1975-2000				
non migrant				---
migrant				-0.002
Industry				
Agricultural sector				---
Non- agricultural sector				-0.042 ***
Level of wealth				
Low				---
Medium				0.023 **
Hi				-0.019 *
Area				
Rural				---
Urban				-0.012
R Square	0.011	0.244	0.253	0.256

Notes: * Significant at the 0.05 level
** Significant at the 0.01 level
*** Significant at the 0.001 level

Sources: Population and Housing Censuses, 1990 and 2000

Table 6: *Multiple regression of factors affecting ever- married Hmong women aged 15-49, 1990 and 2000 .*

Predictor variables	Model 1	Model 2	Model 3	Model 4
Year				
1990	---	---	---	---
2000	-0.038 *	-0.030 *	-0.013	-0.055 ***
Age		1.811 ***	1.729 ***	1.739 ***
Age square		-1.318 ***	-1.259 ***	-1.277 ***
Speaking Thai in HH				
Not speak Thai			---	---
Speak Thai			0.005	0.016
Religion				
Christianity			---	---
Buddhism			-0.008	-0.022
Animism			-0.015	-0.024
Education				
No education			---	---
Some education			-0.089 ***	-0.089 ***
Migration in 1975-2000				
non migrant				---
migrant				-0.022
Industry				
Agricultural sector				---
Non- agricultural sector				-0.087 ***
Level of wealth				
Low				---
Medium				0.089 ***
Hi				0.150 ***
Area				
Rural				---
Urban				0.064 **
R Square	0.001	0.291	0.297	0.310

Notes: * Significant at the 0.05 level
** Significant at the 0.01 level
*** Significant at the 0.001 level

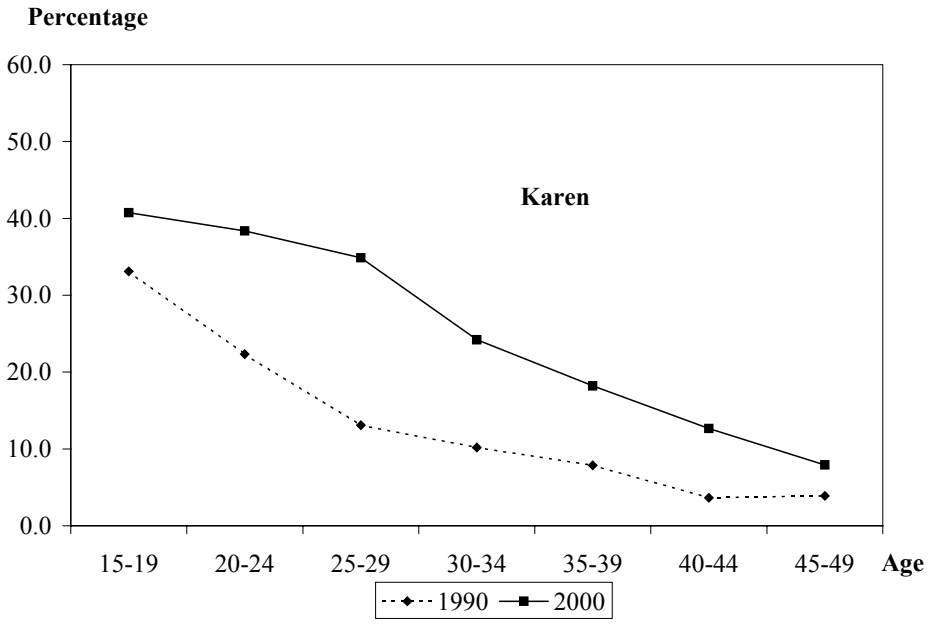
Sources: Population and Housing Censuses, 1990 and 2000.

The Hmong

The findings are very similar to those of the Karen; i.e the changing composition of education attainment, working activity, and level of wealth had significant influence on changing in fertility among the Karen. The difference is that, relative to Hmong women with lowest level of wealth, the higher the level of wealth Hmong women had, the higher was the level of their fertility. Additionally, Hmong women who lived in urban area had .06 more children than those lived in rural area. These findings are not surprising since the Hmong preferred to have more children if they could afford it. In addition, the Hmong had the strong son preference. This finding, to some extent, is consistent with the aggregate level of Hmong fertility that the pace of their fertility decline did not catch up with the increase in their social and economic development.

Some education and non-education

The common factors leading to fertility decline of the Karen and Hmong are education and non-agricultural occupation. Even though the Thai government introduced Thai schooling in the hill tribe areas in 1950s, only one in five ever-married Karen and Hmong women in the reproductive ages had some education in 2000, mostly or over 80 percent primary level (6 years schooling). The results show that there was an increase in proportion of Karen and Hmong women with some form of education in all age groups over the ten- year period (Figure 2). However, the increase in this level of education was considerably faster among the young generation ever-married Hmong women aged below 24 than among the Karen counterpart.



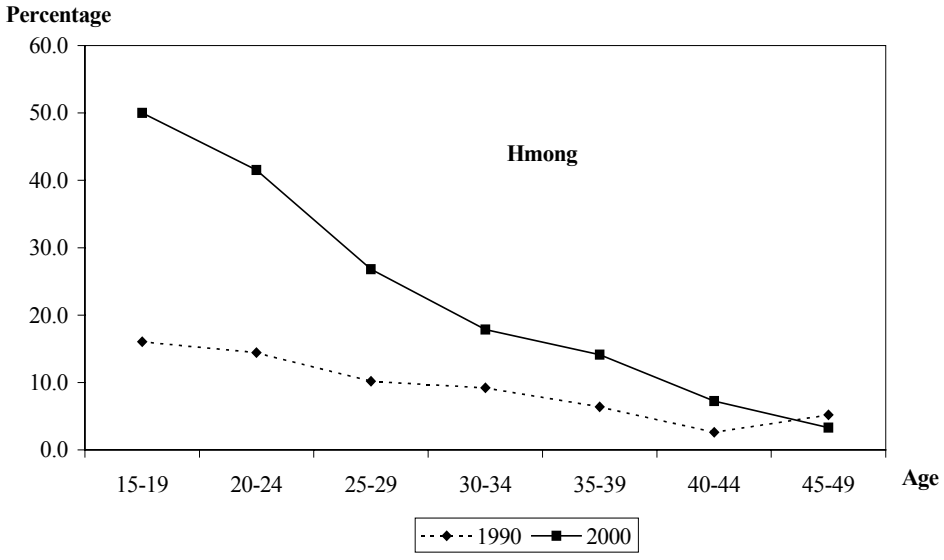
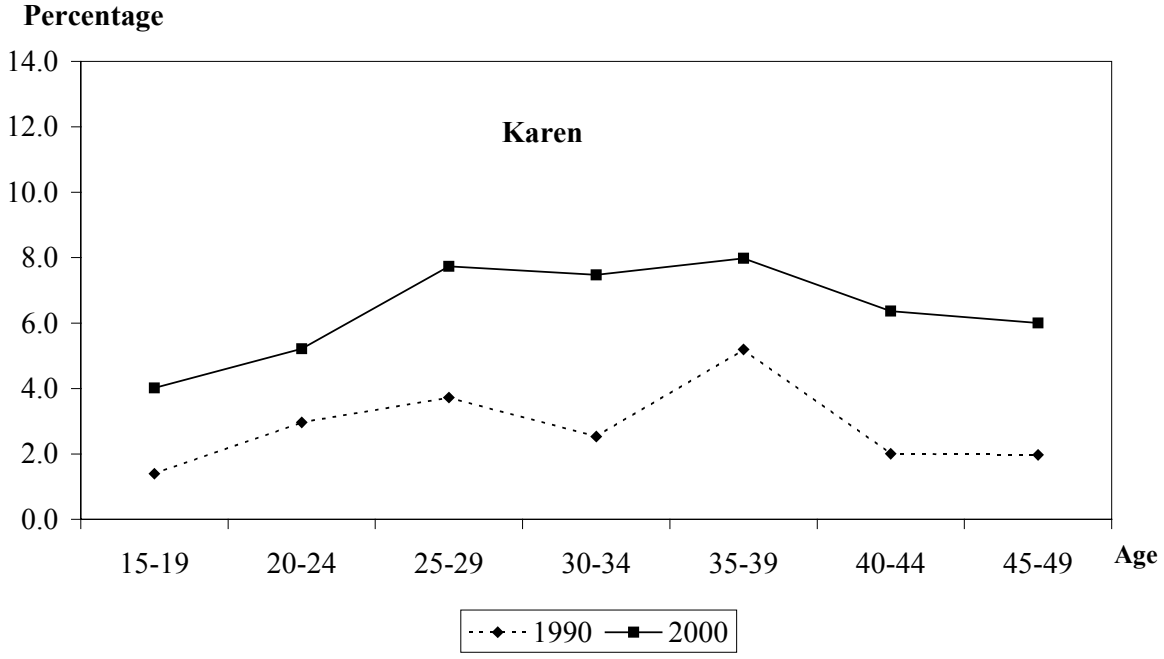


Figure 2. *Percentage of ever-married Karen and Hmong women aged 15-49 years with primary schooling and higher, by age group, 1990 and 2000.*
Sources: The Population and Housing Census, 1990 and 2000.

Agriculture and non-agriculture status

Associated with increased contact with outsiders and increased educational attainment of Karen and Hmong women was an expansion in their economic activity outside the home. Figures 4 and 5 show that the Karen and the Hmong increasingly moved away from their agricultural sector during 1990-2000. This phenomenon occurred to every age group at quite a constant rate. It is evident that Hmomg women engaged in the non-agricultural sector considerably more quickly than Karen women. Women from both ethnic groups engaged in the non-agricultural sector were mainly employees in textile and garment manufacturing and personal services or self-employed in the retail trade concerning their handicraft.



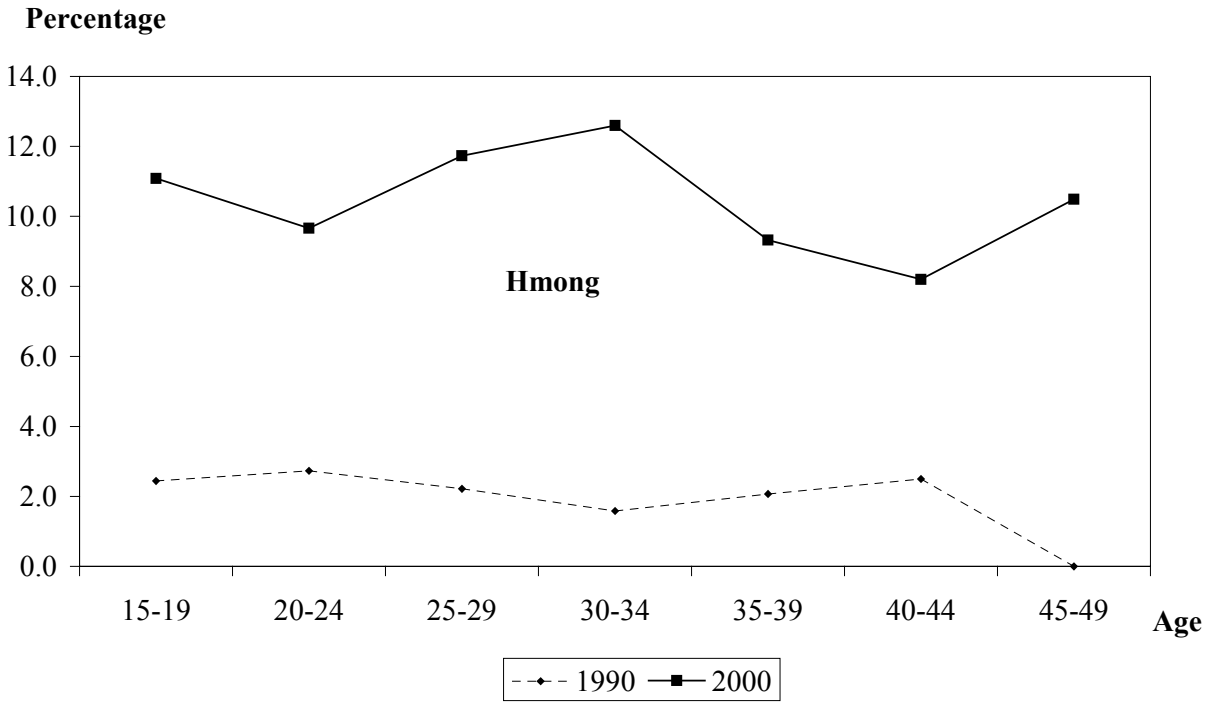


Figure 3. *Percentage of ever-married Karen and Hmong women aged 15-49 years with non-agricultural industry, by age group, 1990 and 2000.*
Sources: The Population and Housing Censuses, 1990 and 2000.

DISCUSSION AND CONCLUSIONS

We have examined evidence on fertility behaviour among the Karen and the Hmong in Thailand, using data from two population censuses in 1990 and 2000. During this ten year period, there were substantial changes in their lives. Even though it is claimed that the government does not have specific policy towards any hill tribe group, the socio-economic development is slower among the Karen than the Hmong.

The increase in levels of socioeconomic development of the two ethnic groups was not consistent with the decrease in their fertility levels. Total fertility of the Karen declined from 5.5 in late 1970s to 3.4 in early 1990s while total fertility of the Hmong declined much slowly from 6.6 to 6.0 during this 20 year period. The Northern Thai fertility declined from 3.7 to 1.9.

Our results suggest that the lack behind fertility of the Karen compared to the Thai is likely to be a temporary phenomenon. Common forces of socioeconomic change and cultural integration will eventually overcome the resistance to small family size and contraception.

The Hmong have almost begun fertility transition if we use convention definition of fertility decline more than 10 percent below their historical high (Bongaarts and Watkins 1996). The pace of decline was much slower among the Hmong, opposite to the Karen, even though mass schooling (proportion of children aged 15-19 with compulsory primary school and over) was achieved and social interaction with the Thai was more convenient (proportion of adults speaking Thai). The finding suggests that the Thai nation building policy did not work at the macro level, at least in our study.

When we consider education of women at the individual level, similarly to the Karen, Hmong women' s schooling contributed to the decline. The shift in their economic base from agriculture to non-agriculture also resulted in fertility decline. The Hmong and Karen, like other groups who moved away from their agrarian roots, will continue to be influenced by the trend away from farming into non-fram occupation.

Reducing language diversity was not found statistically significant in fertility reduction in our study. This is probably because ability to speak Thai is developed not only through schooling but also communication with the Thai. Even though those who could speak Thai can have closer contact through face- to- face communication with the Thai, they may not agree with the Thai attitude or behaviour. It's not necessary that the Hmong want to be like a Thai with the increasing contact with the Thai majority, particularly if they fell disadvantaged and want to preserve their group strength. The Hmong were often accused by the Thai as trouble people [6]

The role of schooling that insists teaching in the official Thai language plays in changing attitudes and behaviour is unclear. It is likely that the relationship between schooling and fertility decline is rather associated with an increase in the status of women, particularly Hmong women than with better communication with the Thai majority through the common Thai language.

The lack of substantial change in fertility among the Hmong seems to be consistent with minority status hypothesis that the combination of a pronatalist ideology, low desire of acculturation and a sense of political disadvantage lead to their higher fertility. To some extent, the minority status hypothesis also recognises that politial context can play a role (Goldscheider, 1971). One important aspect of the political context is government population policies and particularly the extent of state involvement in family planning programs. However, statistics show that the Thai family planning programs for the hill tribes were relatively unsuccessful compared with the Thai majority. The latent demand for small family size of the Thai (two-child family norm) still does not exist among the Hmong. It is difficult to speculate that the pace of fertility decline among the Hmong will be faster with an increase in proportion of educated women or non-farm women if they still prefer large family size.

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[1] The population censuses in Thailand, which are carried out by the National Statistical Office, do not yet attempt to enumerate all members of hill tribe groups. Only hill tribes who do not shift their habitation or are under the central administrative system of the Royal Thai government are included in the coverage of censuses, but appropriate ethnic designation was not available until the 1990 census.

2 We estimated their IMRs using Trussell 's method, but the results seemed to be unreliable. This may reflect, to some extent, quite the low quality of reported children died from the two censuses. However, the errors are systematic that should not seriously affect our multivariate analysis.

[3] A major difficulty in attempting to relate individual characteristics to children ever born is that most characteristics refer to current status while number of children ever born is a cumulative measurement relating to some past period.

[4] Hill tribes include nine major ethnic groups: the Karen, Hmong, Lahu, Akha, Lua , lisu, Yao Khamu and Htin, and Northern Thai refers to those living in the administrative Northern Region.

[5] Between 1978-1991, Thai compulsory education consists of 6 years of schooling. In 1992, Thailand adopted the policy to extend compulsory education from 6 to 9 years, and it becomes law in 2003. The 1997 current Constitution provides for the first time that all the Thai people will have equal rights to receive basic education for at least 12 years, of quality and free of charge.

[66] From an article "Current Hmong Issues: 10 point statement" by Dr. Gary Lee and Dr. Nick Tapp at Web site: www.neeg.org/page12.html.