

Fertility decline in a village in Laos

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1. Introduction

Laos is one of the countries keeping high fertility in Southeast Asia and still experiencing high population growth rates over 2% per annum in the 2000. Recently, however, Laos began to show fertility decline and to follow a path to the demographic transition, despite still low national income per capita.

I think there are generally two different fertility decline paths in the demographic transition in developing countries, that is, pre-industrialized path and industrialized path. The former is a path in which fertility decline mainly occurs through diverse changes caused from imbalance between population and resources in rural areas, through which fertility, mortality, migration, and socio-economic changes are mutually related. This is in the process of the onset of fertility decline in developing countries. The latter is a path in which mainly new middle class people in developing countries practice fertility control because of increasing costs for raising their children, increasing of opportunity cost of mother's rearing children and following to fertility decline of the former path. Laos is now in the midst mainly the former path, pre industrialized path.

In this paper, first, an idea of the demographic transition in developing countries is introduced. Second, on its basis, how and why people in an economically poor village near Luangphabang in Laos are lowering fertility is investigated by a qualitative analysis mainly using data of interview surveys.

2. A framework of the demographic transition

The demographic transition is a process of change from the pre-industrialized adjustment regime in which fertility, nuptiality, mortality, migration, and socio-economic changes are mutually interrelated, to the industrialized regime in which vital and migration changes have independently related to socio-economic changes (Figure 1). In the adjustment regime economic base is mainly agriculture and market economy is not so developed. Characteristics of the adjustment regime and change to new regime vary among countries due to their socio-economic conditions, cultural differences, historical backgrounds, and so on.

In many developing countries decline of death rates since World War II had brought about population growth and resulted in an increase of the surplus labor force

in households in rural areas. This was absorbed by the various ways of adjustment such as the opening-up of farmland, increases of agricultural intensity, migration to other rural regions for mainly looking for new land and agricultural employment, and migration to urban regions for non-agricultural employment, growth of which related to economic development in developing countries. When they had limits to such ways

Figure 1-a Population Adjustment Regime

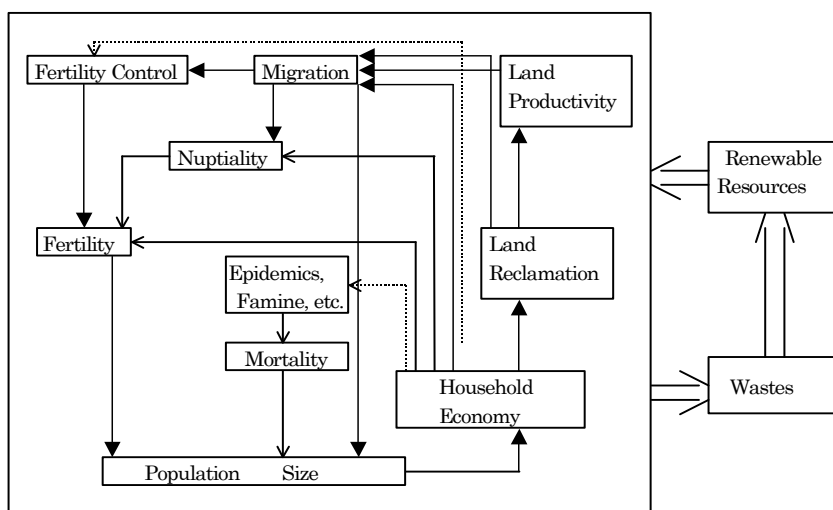
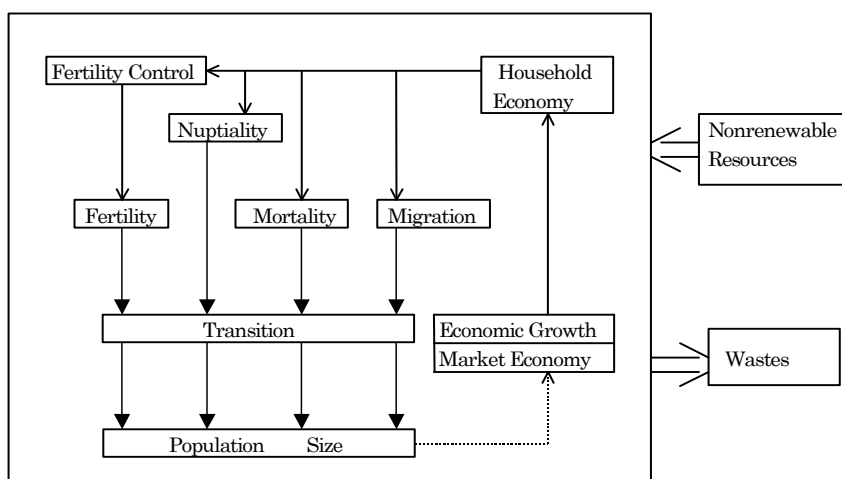


Figure 1-b Industrialized Regime



to absorbing the imbalance of labor force, they found control of fertility as last resolution. National family planning programs in developing countries have been introduced since mainly the 1960s, and they were generally in good timing for people

who desired to practice fertility control. Thus, in rural areas of developing countries, fertility decline began mainly in the pre-industrialized adjustment regime. Therefore, if the imbalance between population and resources is improved, fertility decline will often stall on the way to the demographic transition.

On the other hand, large urban areas like primate cities have had characteristics of industrialized regime and shown more remarkable fertility decline than rural areas. In urban areas new middle class people who are business elites, official workers and self-employed persons in modern sectors are increasing with economic growth in many developing countries. They are very conscious of raising children with high educational attainment. Many women with husbands in the same class are working. With development of market economy in those areas people tend to get more and more consumer durables or services within their limited budgets. These factors naturally brought about motives of reduce their children and generally people in large urban areas had controlled fertility before introduction of national family planning. This is fertility decline in industrialized regime in developing countries.

I think these two processes of fertility decline recently began to occur in Laos, while mutual relationship among vital, migration, and socio-economic factors had rather some difference than in other developing countries.

3. Population and economic changes in Laos

1) Population changes

Laos is an inland country surrounded by China, Vietnam, Cambodia, Thailand, and Myanmar. Population in Laos is 5.5 million in 2002. Population density is still very low (23 persons / km²), but population density by arable land is not so low because of most of her land covered with steep mountains where people do not inhabit. In fact, population density by cultivated areas is about 860 persons / km² which is the same level as the density in Meiji era in Japan.

As population data in Laos was not complete until 1985 when first census was conducted, many population data before the 1980s are only obtained from a part of statistics by the government in the 1960s to the early 1970s or data estimated by United States and United Nations. According to an UN estimate (Table 1), population growth rates were about 2 % until the early 1980s and not so high as other developing countries where the annual growth rates were generally between 2.5 and 3 %. This was because despite decline of death rates since the post-war time, death rates were still relatively high due to many civil wars and after the establishment of the socialist government in 1975 many people migrated to foreign countries. It is considered that birth rates were high until recent times, but they began to decline after the latter half of 1990s.

Table 1 Changes of population and vital rates in Lao PDR

	Population (1,000)		Population Growth Rates (%)	Birth Rates (‰)	Death Rates (‰)	Total Fertility Rates	Infant Mortality Rates per 1,000 births
1950	1,755	1950-1955	2.1	46	25	6.2	180
1955	1,944	1955-1960	2.3	45	23	6.2	160
1960	2,177	1960-1965	2.2	45	23	6.2	150
1965	2,432	1965-1970	2.2	44	23	6.2	147
1970	2,713	1970-1975	2.2	44	23	6.2	145
1975	3,024	1975-1980	1.2	45	21	6.7	135
1980	3,205	1980-1985	2.4	45	19	6.7	128
1985	3,621	1985-1990	2.6	45	18	6.3	116
1990	4,132	1990-1995	2.5	41	16	5.8	104
1995	4,686	1995-2000	2.4	38	14	5.3	97
2000	5,279						

Source) United Nations, *World Population Prospects: The 2004 Revisions*, 2005.

Looking on regional differences of fertility and nuptiality (Table 2), in 1995-99 Vientiane Municipality including capital city shows the lowest total fertility (2.4) which figure means controlled fertility. Though rural regions show still high fertility, Vientiane Province neighboring to Vientiane Municipality and the northern periphery provinces such as Bokeo, Xayaboury, and Luangnamtha have relatively low fertility.

Table 2 Fertility and nuptiality by province in Lao PDR

	Total Fertility Rates		Princeton Index (1995)			SMAM (1995)	
	1985	1995-99	If	Ig	In	Women	Men
Vientiane Municipality	5.4	2.4	0.22	0.38	0.58	23.4	26.6
Phongsaly	5.7	5.5	0.36	0.50	0.73	20.5	23.0
Luangnamtha	4.4	5.1	0.31	0.45	0.70	20.5	23.5
Oudomxay	5.3	5.9	0.39	0.53	0.73	19.6	23.1
Bokeo	5.7	4.0	0.34	0.46	0.74	19.8	23.3
Luangprabang	6.4	5.0	0.41	0.56	0.72	20.3	22.9
Huaphanh	7.1	6.8	0.44	0.59	0.75	20.1	22.0
Xayaboury	5.9	3.5	0.36	0.48	0.75	20.0	23.3
Xiengkhuang	10.0	5.8	0.50	0.66	0.75	19.9	22.6
Vientiane Province	7.1	4.2	0.33	0.47	0.71	20.8	24.3
Borikhamxay	6.7	5.1	0.39	0.53	0.73	20.4	23.5
Khammuane	5.3	5.5	0.34	0.52	0.66	21.3	23.3
Savannakhet	6.0	5.1	0.35	0.53	0.66	21.2	23.6
Saravane	5.6	5.8	0.39	0.57	0.68	20.3	22.6
Sekong	5.6	5.5	0.37	0.52	0.71	20.1	23.5
Champasack	5.8	4.9	0.34	0.57	0.60	22.6	24.4
Attapeu	5.4	5.8	0.34	0.51	0.67	21.1	23.0
Xaysomboon Special Region	-	7.3	0.49	0.60	0.81	18.8	22.5
the Whole Country	6.4	4.9	0.35	0.52	0.68	21.1	23.8

Note) For calculating Princeton Index, population of age by 0-4 years were used in place of births.

Sources) LAO P.D.R. State Statistical Center, *Population of LAO P.D.R.*, 1992.; LAO P.D.R. National Statistical Center, *Summary Report of Provincial Data Analysis*, 2003.; — — —, *Results of the Population Census 1995, 1997.*

Age at marriage is still young in most regions except Vientiane Municipality and people in Laos have universal marriage norm.

Judging from changes of total fertility rates, we can say fertility in most of provinces began to decline.

Internal and international migration changes in Laos were not clear until the 1995 when migration was first enumerated in the census. Generally, since the civil war after the end of World War II it has been considered there was much domestic migration of refugees within rural regions and between rural to urban regions. Since establishment of the new government in 1975, refugee migration to foreign countries has much increased, but since the government adopted New Economic Mechanism in 1986 which liberalized most of economic activities, the refugee migration has decreased, and rather return migration from foreign countries increased, and internal migration from rural to urban areas and from urban to Vientiane city has been increasing.

2) Economic changes

Although recently Laos is performing high economic growth as well as other ASEAN countries, her GDP per capita is about US\$ 400 in 2004 showing still the value of least developing countries. Agriculture and forestry, therefore, have important role in her economy.

Agricultural labor force population accounts for about 80 % in total labor force population. In mountainous areas they do slash-and-burn farming (shifting agriculture). Around the Mekong River running mainly along the west boundary of the country there are relatively fertile low lands where paddy rice farming is dominated. Although slash-and-burn farming was once prevailed in most of mountainous areas, the government promoted to shift to more intensive commercial agriculture since the 1990s as mentioned below.

Forest in Laos was abundant and its area was about 80% of total area in 1950. But since then it has decreased by developing new land for shifting agriculture and cutting many trees for mainly exporting to foreign countries. Now the forest area is only 40 % of the total area. The government of Laos has made efforts to preserve forest area since 1975 when the new government established. Actual movement of forest rehabilitation by the government began in the end of the 1980s. The government applied policies to restrict slash-and-burn agriculture which had been considered to be one of the serious activities to reduce forest areas. Many farmers were introduced to stop to do slash-and-burn agriculture and redistributed new lands for making commercial agricultural products such as adlay, paper mulberry, a various kind of fruits, and so on.

Urbanization in Laos is still in lower level than in other ASEAN countries.

Vientiane as the capital city has population of only 500 thousand which is one tenth of total population in Laos. Recently, however, Vientiane, and Savannakhet, central city in Southern part, are developing according to the economic growth in Laos.

4. Fertility decline in a village in Luangphabang Province

The village Phathung which is selected for the intensive survey is located in 40 km far from Luangphabang, an old city of once the capital of Laos (Figure 2). It is along Wu River which is a branch river of Mekong. The survey was conducted twice during each one week in January and September in 2004.

The village population was about 300 in 2004, and the number of households was 54, while it was 36 in the early 1960s according to memory of old influential people. If this is true, it is estimated that annual population growth rate is about 1.3% which is rather modest growth of population.

Figure 2 Map of location of Village Phathung in Laos



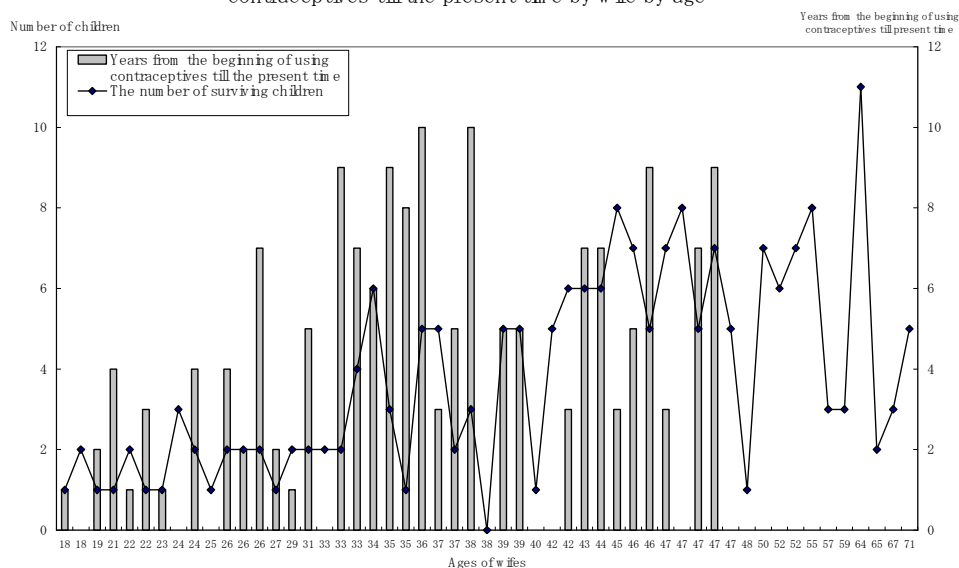
Village people have once done slash-and-burn farming in which glutinous rice for their food was mainly made. In those days their economy was mostly self sufficient, and a small portion of livestock products such as eggs, chickens, ducks, and goats, fruits and teak were main sources for gaining cash. In the year of 2000 the government moved the village to more convenient place which is along a main national road (No. 13), allocated 3 ha of agricultural land in principle to each household, and encouraged to make commercial agricultural products, for example, a plant for paper materials, adlay, vegetables, fruits, and teak, and to reduce rice making for self-sufficiency by

slash-and-burn method.

Educational attainment is gradually improved. Particularly recent primary school enrollment is near 100%, and the dropout percentage is decreasing. The village had no electricity just until the early 2005. Ethnicity of the village people is Lower Lao (Lao Loum) who is a main ethnic group in Laos.

Fertility in the village has been rapidly declining. Most of married women of less than 30 years old have used some birth control method (Figure 3) and answered in the interview survey they wanted only two or three children. Birth spacing program was introduced first in 1993 in the village. Since then many women over thirty years old have adopted contraceptive devices such as the Pill, IUD, and so on. As a matter of fact, they reduced their number of children not by birth spacing but by parity control. It is very interesting that the decline had begun before the agricultural change by land allocation, the village movement and significant development of market economy.

Figure 3 The number of surviving children and years from the beginning of using contraceptives till the present time by wife by age



In order to explain how and why fertility in the village declined, we examine the relationship among fertility, mortality, migration, and agricultural changes through life course of the post-war three birth cohorts, that is, the 1950s (1945-59), the 1960s (1960-74), and the 1970s (1975-89) cohort (Table 3). Furthermore, we use the concept of effective fertility showing surviving children up to 30 years old who are considered as one generation. If effective fertility is 2, parents in a family can have two children just inheriting them. If effective fertility is more than 2, for example 4, another two children have to get new lands or new jobs. They often migrate to other regions for getting them.

Table 3 Life courses by birth cohort in Phathung Village

Life courses by actual number														
Birth cohort	Died in less than 30 years old	Staying in the village				Migrating to other areas						Total children		
		Born in the Village		Migrated from other areas		To rural areas		To urban areas						
		Men	Women	Men	Women	Men	Women	Men			Women			
								Total	Luang phabang	Vientiane	Total		Luang phabang	Vientiane
1945-59	21	11	21	7	1	8	8	4	1	3	5	3	0	78
1960-74	30	13	15	5	6	21	16	17	9	7	7	6	0	119
1975-89	19	17	26	4	6	9	12	18	8	9	6	2	4	124

Life courses by 6 children which are completed fertility in the village														
Birth cohort	Died in less than 30 years old	Staying in the village				Migrating to other areas						Total children		
		Born in the Village		Migrated from other areas		To rural areas		To urban areas						
		Men	Women	Men	Women	Men	Women	Men			Women			
								Total	Luang phabang	Vientiane	Total		Luang phabang	Vientiane
1945-59	1.6	0.8	1.6	0.5	0.1	0.6	0.6	0.3	0.1	0.2	0.4	0.2	0.0	6.0
1960-74	1.5	0.7	0.8	0.3	0.3	1.1	0.8	0.9	0.5	0.4	0.4	0.3	0.0	6.0
1975-89	0.9	0.8	1.3	0.2	0.3	0.4	0.6	0.9	0.4	0.4	0.3	0.1	0.2	6.0

Notes) Persons migrated other areas are not included in 7 children. The figures of lower columns mean ratio to children born in the village.

Total children in actual number include persons studying in schools.

6 children are average births born to couple's parents.

1) Cohort born in 1945-59

In the cohort born in 1945-59 who began to work in the 1960s, their parents had about 6 children in average, but about two children died before they replaced to their parents. Therefore, effective fertility was about 4 children. In those days village people's principal way of production was slash-and-burn (shifting) agriculture. It was difficult to accept the all surviving children as new labor force of this extensive agriculture. Actually, about 1 person among them migrated to other rural areas and about 1 person to urban areas. 3 persons including persons coming from other rural areas stayed in the village and engaged in slash-and-burn farming. Because two persons in effective fertility were replacing and succeeding their parents, one surviving child became surplus and they were absorbed by reclaiming nearby forests for new agricultural land or increasing intensity, that is, reduction of rotation of fallow plots in slash-and-burn farming.

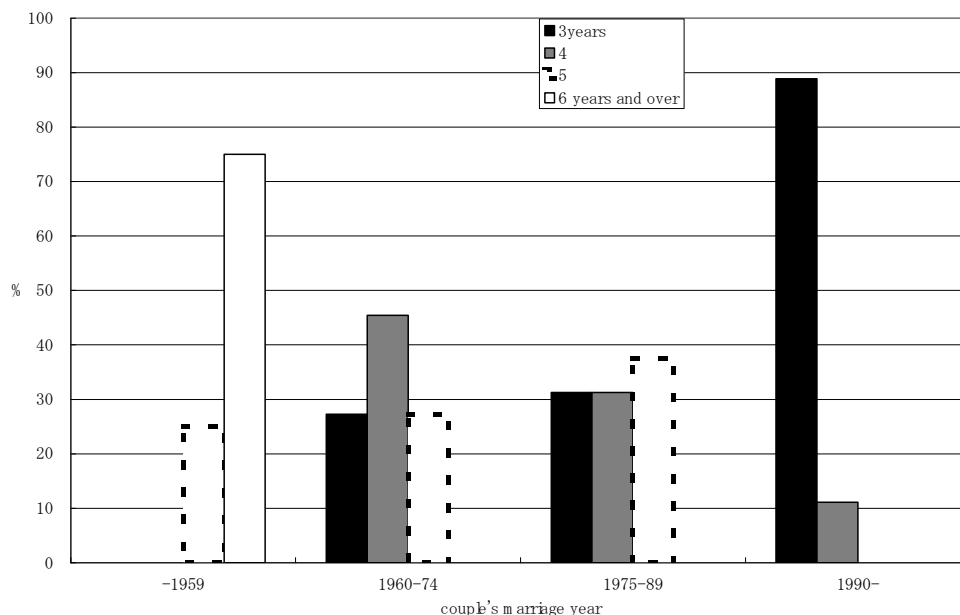
In this village one cycle of rotation in the farming in the early 1960s was 5-10years (Figure 4). Land for slash-and-burn agriculture was commonly used and distributed in proportion to the number of family members, and most of working processes such as burning trees, weeding, and harvesting were also commonly done. In those days they still had forest lands to newly develop, although it became gradually difficult to get new agricultural lands because new lands located generally far from the village. Therefore in the village both development of new lands and reduction of one cycle of rotation (5-6years to 3-5years) in shifting agriculture occurred at the same time.

2) Cohort born in 1960-74

The second cohort born in 1960s became labor force in the latter of the 1970s when Laos changed to a new socialist country. Effective fertility of the cohort was still

4 persons even if their parents had the same fertility as the former generation because mortality improvement stagnated due to continuing civil wars from the 1960s up to 1975. In this cohort about 2 persons moved to other rural areas and 1.3 persons to urban areas, particularly neighboring central city, Luangphabang. Only 1.5 persons born in the village and about 2 persons including migrants from outer areas did shifting agriculture in the village. In this cohort there were few population growths in the village. In those times the reduction of years of the cycle in shifting finished because it was difficult to reduce years of one cycle in shifting to less than 3 years in the area. At the same time it also became difficult to clear forests for new farmland as the government began to restrict newly clearing of forests since the late 1980s. Despite this, even in 1990s villagers reclaimed forest land for agricultural use, although the amount of change to agricultural lands was small.

Figure 4 Percent changes of rotation year of shifting agriculture by couple's marriage year



3) Cohort born in 1975-89

People in this cohort were born after the latter half of the 1970s and began to work in the 1990s. If their parents had the same 6 children as the former parents, the effective fertility in this cohort was about 5 persons because of improvement of mortality level for which about one child died before their replacement to their parents (Table 3). Rural to rural migration in the cohort considerably decreased, 1 person comparing with 2 persons of the former cohort. This is because also in other rural areas both continuing restriction of forest reclamation and the beginning of allocation of land by the government which gave the right of land possession to rural areas occurred at

the same time. Rural to urban migration did not increase comparing with the former cohort, but migration to the capital city Vientiane was gradually increasing. In this village migration to urban areas is still modest. Generally this is true in other rural areas in Laos. As a result about 2 persons among surviving children in the cohort migrated to other rural and urban areas, considerably decreasing comparing with 3 persons of the former cohort.

On the other hand, persons of the cohort staying in the village increased, and almost 3 persons including migrant people from other areas are newly added within a family. This means net increasing member within a family is about one person. The increase of such young people remaining in the village is partly because since 2000 the government has promoted the shift of slash-and-burn farming to commercial farming and allocated new lands to any people in the village who can compose a household and make farming. In this village many young women and men married, and they got new allocated lands. But according to the village head, it is estimated that forest lands for allocating to future new couples are about 30 ha. This shows that the lands can be used only 10 new households (3ha/household) and in the near future some persons in this cohort will not be absorbed by this land allocation, because nearly 30 young women and men are still single in the village. Some of them will have to find the other way to resolve their population pressure.

Furthermore, a market economy is gradually developing even in this rather economically poor village. Although villagers do not have durable consumer goods such as cars, electric goods and so on, a half of them have bicycles and small radios, and some got motor bikes recently. People realize cost increase of child rearing because they want to give higher education to their children. In addition, the change to commercial farming method accelerated the penetration of market economy in the village. They have begun to make such commercial agricultural products as adlay, teak, fruit and so on since the 1980s. Since 2000 they have increased such commercial products and reduced rice production by shifting agriculture for their eating. Now more than a half of villagers buy rice.

Just in this time the government had introduced rather moderate family planning program, that is, birth spacing program, in the late 1980s. This program was introduced in the early 1990s in the village. Owing to this program, mainly young and middle aged women in the village began to practice fertility control.

5 Discussion

Surplus population due to decline of death rates in the village had increased in the 1950s. It was absorbed first by farm land increase by neighboring forest reclamation and increase of intensity in slash-and-burn farming, secondly by internal migration to other rural areas, and thirdly by rural to urban migration, mainly

neighboring cities in the 1980s and further to the capital city since the 1990s.

But these ways of absorption of surplus population have encountered difficulty. First the shortening of rotation years of shifting came to limits. In the early 1990s rotation years became almost 3 years which are minimum years for slash-and-burn agriculture. Secondly, the government controlled forest use, particularly forest use for slash-and-burn agriculture, and promoted the shift of slash-and-burn farming to commercial farming since the early 1990s in the village. Thirdly, slow urban economic growth hindered migration to urban areas. In the capital city Vientiane and other main cities in Laos there is not much pulling power for manual labor workers like factory laborers, service laborers and so on which young people with only primary education level in the village can be engaged in.

In addition, circumstances of rearing children and village economy are changing. First, village people became conscious of importance of higher education for children. This means they want their children not to live in the village in future but get jobs in urban areas. Now rates of dropping out of schools are decreasing and children going on to junior and high schools which are located district town about 10km far from the village are increasing. They think costs of child rearing are drastically increasing. Second, market economy in the village is more and more getting forward. This is conflicting with relative increase of child rearing costs in their household budget.

In these circumstances people became conscious of difficulty of having many children. Couples married in the early 1980s had already thought they could not have many children. Furthermore, the government introduced relatively modest family planning program and the government doctors came to the village in 1993. Since then firstly middle aged women in the village have adopted birth control and young women also family planning gradually. If this trend continues, in the village where most people are still economically poor, total fertility rates will decline 2 to 3 in the near future.

Future problem in the village is surplus population of next generation cohort of ages between 5 to 10 which will enter to labor force in the near future. They have the highest effective fertility over 5 persons. I think it is difficult the government will provide agricultural land for long time to village people who make new family and want to have land for their livelihood. If new provision of land ceases, all young potential labor force people have to look for more intensive agricultural methods or go out from the village and to get jobs in urban areas or foreign countries. The former is not realistic, considering the situation of the mountainous land quality and agro-forestry. Therefore, in the near future at least 3 live persons per household of ages between 5 to 10 will have to go out other areas, particularly in urban areas where now demands of employment are still low because even capital city, Vientiane has few attraction of manufacture or service industries to foreign direct investments. This

difficult situation for rural people is not different in the mountainous areas occupying 70 % of Laotian population. The resolution of the problem is firstly increase of urban employment and secondly improvement of educational attainment, particularly promotion to high school graduation persons of which can have potentials to work in modern factories or service institutions.

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