

No. 039

**THE OBSERVATION REPORT
ON
INFECTIOUS DISEASES
IN
LAO PEOPLE'S DEMOCRATIC REPUBLIC**

1990

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

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PREFACE

In view of the fact that the control of infectious diseases is an important subject in the health sector of the developing countries, the Japan International Cooperation Agency (JICA) decided to conduct a basic study on the present state of infectious diseases in Lao People's Democratic Republic (Lao PDR) as one of its activities for 1989.

JICA entrusted the contract works to the International Medical Foundation of Japan (IMFJ) and sent to Lao PDR a study team with three members headed by Dr. Masao Yoshida, consultant to the Foundation, from September 27 to October 22, 1989.

The study team exchanged views with the officials concerned of the Government of Lao PDR, and conducted a field survey in Vientiane and other parts of Lao PDR.

After the study team returned to Japan, the data obtained from the field study were analyzed and the present report has been prepared.

I hope that this report will be useful for the further promotion of Japan's cooperation in health and medical problems with Lao PDR.

I wish to take this opportunity to express my deep appreciation to the officials concerned of the Government of Lao PDR for the cooperation and hospitality extended to the study team.

February, 1990

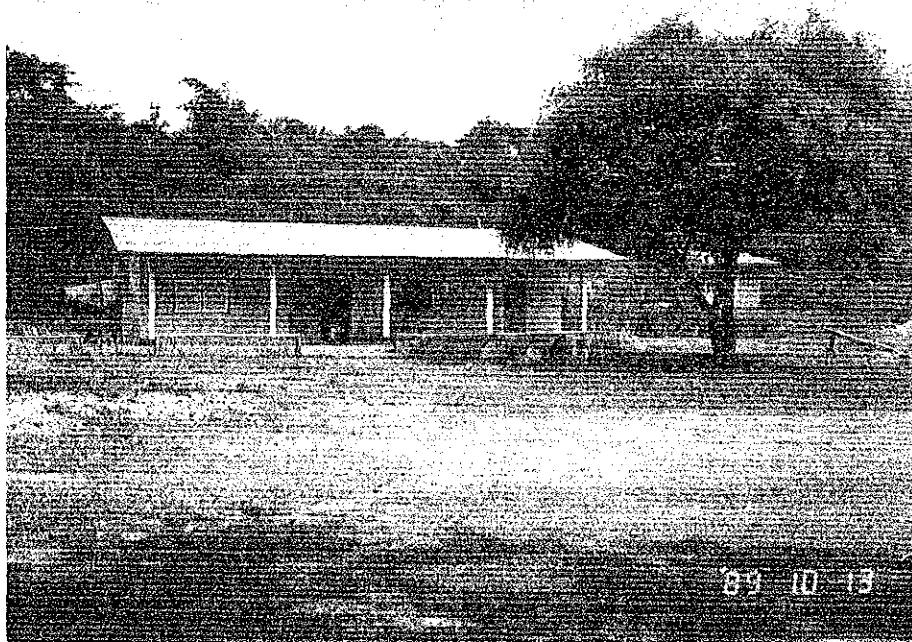
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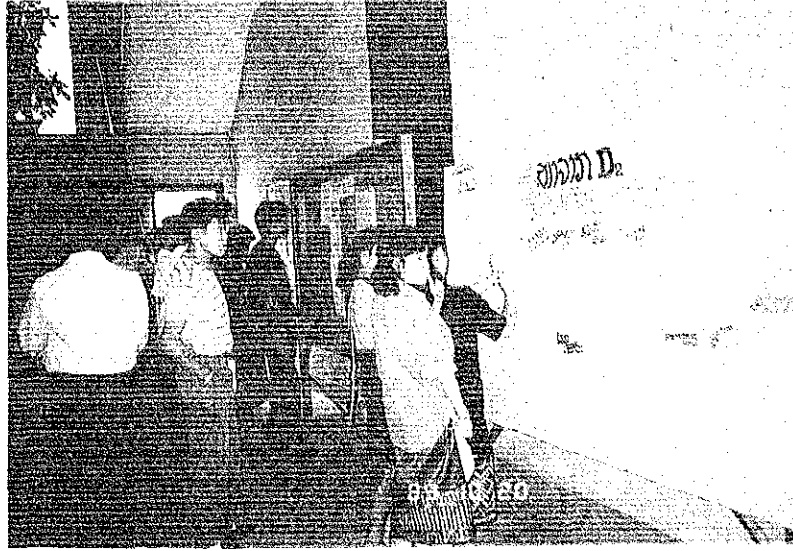
The JICA observation study team greatly acknowledges the kind cooperation given by a large number of Laos authorities concerned with health services. Without their devoted helps the team would not be able to complete their observation within such a short period.



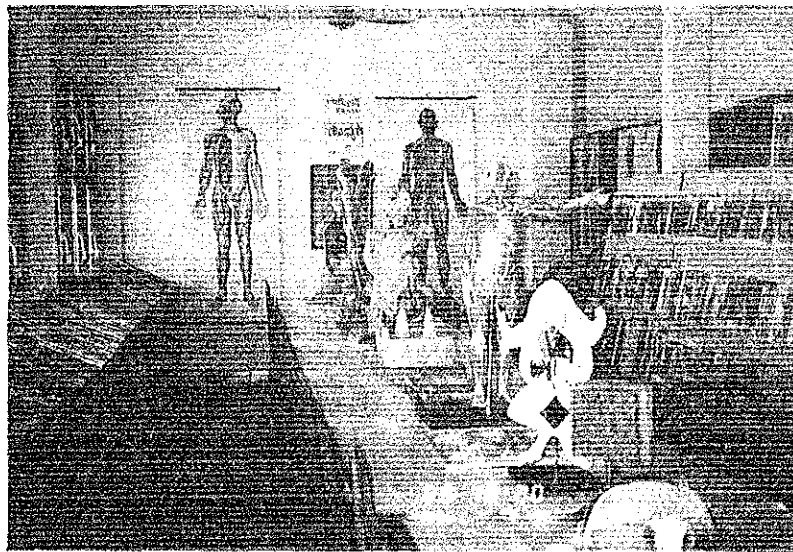
District Hospital at Luang Prabang Province (1)



District Hospital at Luang Prabang Province (2)



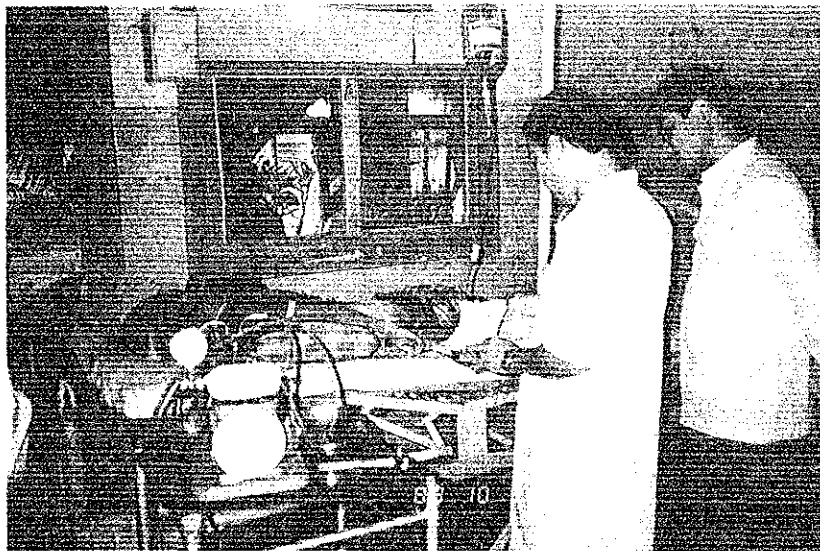
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Entrance of Mahosot Hospital



Infectious Diseases Ward of Mahosot Hospital

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2. Sethathirath Hospital
3. Department of Health Economic and Planning, MOH
4. Department of Health Manpower Training, MOH
5. Ministry of Health and Social Welfare (MOH)
6. Ministry of Foreign Affairs
7. Leprosy Institute
8. Water Supply and Sanitation Head Quarter NIHE
9. Water Treatment Plant (Kao Leo)
10. UNICEF (Vientiane Office)
11. WHO (Vientiane Office)
12. National Blood Transfusion
13. Mahosot Hospital
14. No. 3 Pharmaceutical Factory
15. Institute of Malariology and Parasitic Disease (IMPD), MOH
16. Public Health and Social Welfare Services of Luang Prabang
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17. Provincial Station of Hygiene and Epidemiology, Luang Prabang
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I. INTRODUCTION

In order to explore future cooperation, Japan International Cooperation Agency (JICA) decided to carry out an observation of the present status of infectious diseases as well as the control strategies in Laos by sending the present observation team composed of 3 members who cover public health, microbiology and parasitology.

The team has been in Laos for 26 days, from September 27 to October 22, 1989, and visited Vientiane, the capital of the country, and some provincial areas of Luang Prabang Province. In those places the team studied available informations on the health status and other health related documents, and observed the existing intitutions for preventive and curative services, manpower programmes and activities to control various infectious diseases. The team also discussed with the authorities concerned on the health status of the people of Laos and strategies to control the diseases prevailing in the country or the areas visited.

This report summarizes the observations and some recommendations for the future cooperation.

II. OUTLINES ON LAO PEOPLE'S DEMOCRATIC REPUBLIC

1. GENERAL VIEW

The Lao People's Democratic Republic (Laos) is a young nation. Children below five comprise 17.3%, and those under 15 make up nearly 45% of the population. It is also a poor and developing nation which until 1975 had been engaged in a protracted war spanning more than a quarter of a century.

The current situation of children and women in the country is marked by high infant and child mortality and morbidity. Maternal health is poor and expectation of life is low. Much of the population is without access to safe water and adequate sanitation facilities and this is directly and indirectly responsible for the high prevalence of diseases and the poor health conditions among the people. In general, the level of health care in the country is well below adequate, and public consciousness with regard to health education is low. This is linked in part to the low educational and literacy levels of the population. Women are more likely than men to be illiterate and girls are more likely than boys to drop out of school. As women are ultimately the producers and cares for children, this educational handicap among women in turn works against the survival and development of children.

These conditions associated with children and women in Laos are closely interrelated with the country's geographical and historical background which in turn accounts for largely the country's present low level of economic development, poor social and economic infrastructural base, shortages of human and material resources. Hence it is imperative that the present situation of children and women be assessed in the context of these background factors.

After the revolution in 1975, the political situation became more stable relatively early and until the present time, The First 5-years Plan on Socio-Economic Development was instigated, with the assistance of satisfactory increase or agricultural production in 1980

and 1981, the foundation of the party and government were established. In March 1985, the first census in the country was accomplished.

2. BACKGROUND

2-1. The Land

The Laos, situated in the heart of mainland Southeast Asia, is one of the least populated and least developed countries in the region. Landlocked, the country is bordered on the east by Viet Nam, west by Thailand, north and northwest by China and Burma and south by Kampuchea. The Mekon river, which forms much of Laos' international boundary with Thailand, is also the country's main waterway.

The Laos is also a country which is composed predominantly of mountains and plateaus. The only exception is the Mekon valley which form its most habitable heartland. Herein lies more than 80% of the agricultural lands and the greatest concentration of the country's population, as well as communication and infrastructural network. The rest of the country is still largely forested and sparsely populated. Transportation into these forested mountain zones is either non-existent or very difficult. The rugged terrain poses a major problem of access.

Climatically, Laos lies within the tropical monsoon belt of Asia. It has a distinctly wet season from May to September/October and a markedly dry season from November to March/April. Annual rainfall ranges between 1,200 mm in Luang Prabang to nearly 3,600 mm on the Boloven Plateau. In terms of agricultural activity, it is seasonal variation of the rainfall rather than its total availability which sets the limit to crop production. Periodical flooding followed by drought are common occurrences and these present serious problems to agriculture and communication.

The country's landlocked position is also a distinct disadvantage. International access is highly dependent upon the maintenance of

Table 1. POPULATION OF LPDR BY PROVINCE AND BY SEX (1985)

Province	Total	Male	Female
Vientiane Municipality	377,409	193,136	184,273
Phongsaly	122,984	59,925	63,059
Luang Nam Tha	97,028	46,435	50,593
Oudomsay	187,115	90,570	96,545
Bokeo	54,925	26,360	28,565
Luang Prabang	295,475	146,202	149,273
Houa Phanh	209,921	104,740	105,181
Savaboury	223,611	109,763	113,848
Xieng Khouang	161,589	80,611	80,978
Vientiane	264,277	132,572	131,705
Bolikhamxay	122,300	59,931	62,369
Khammouane	213,462	102,040	111,422
Savannakhet	543,611	263,856	279,755
Saravane	187,515	88,240	99,275
Sekong	50,909	24,657	26,252
Champassak	403,041	19,240	207,801
Aatpeu	69,631	32,837	35,794
TOTAL	3,584,803	1,757,115	1,827,688

source : UNICEF

Table 2. AGE DISTRIBUTION OF POPULATION OF LPDR (1985)

Age Group	Total	Percent	Male	Female
0 - 4	620,470	17.3	315,959	304,511
5 - 9	511,103	14.3	261,046	250,057
10 - 14	454,360	12.7	231,548	222,812
15 - 19	344,954	9.6	161,777	183,177
20 - 24	281,716	7.9	126,233	155,483
25 - 29	277,759	7.7	131,810	145,949
30 - 34	199,137	5.6	95,520	103,617
35 - 39	187,923	5.2	93,486	94,437
40 - 44	128,363	3.6	60,492	67,871
45 - 49	141,437	3.9	67,597	73,840
50 - 54	110,826	3.1	53,047	57,779
55 - 59	102,455	2.9	49,505	52,950
60 - 64	79,288	2.2	39,250	40,038
65 - 69	58,477	1.6	30,130	28,317
70 - 74	36,731	1.0	17,205	19,526
75 +	49,834	1.4	22,510	27,324
TOTAL	3,584,803	100.0	1,757,115	1,827,688

source : UNICEF

friendly political relations and goodwill of neighbouring countries. Given the conflicting interests and the geopolitical intricacies of the region, has often proven to be a constant and difficult diplomatic task for the Lao government.

2-2. The People

The 1985 census enumerated a total population of 3,584,803 people distributed over a total area of 236,800 sq. km., giving an average density of 15.1 persons per sq. km; however, population distribution is very uneven. More than 60% of the population are concentrated in the riverine provinces bordering the Mekon, namely Vientiane, Savannakhet, Champassak, Luang Prabang and Khammouane (Table 1).

The Lao PDR is also an ethnically diverse society. No less than 68 ethnic groups have been enumerated within its geographical boundaries. These ethnic groups are often divided into three main groups: lowland Lao (Lao Lum), midland Lao (Lao Theung), and upland Lao (Lao Sung). Lao Lum accounts for an estimated 45-50% of the population from the majority group. Lao Theung, are made up of groups like the Khmu, Loven, Tin and Lamet, constitute another estimated 30%. The Lao Sung who are mainly Yao, Mien and Muong, comprise about 15% of the population. The rest of the population consists of ethnic Vietnamese, Chinese, and Indians who are found chiefly in the urban areas.

Unlike other countries in South Asia where there has been a rapid growth in the urban population through rural-urban migration in the last decade, the Lao PDR remains predominantly a rural country. Only 15% of the population is classified as urban. The largest urban concentrations are found in the cities of Vientiane (150,000), Savannakhet (500,000), Pakse (20,000) and Luang Prabang (8,000). The remainder of the people are found in some 11,000 or more villages scattered throughout the country. This pattern of population distribution and diversity are factors which impinge upon the country's

development programme. The rural character of the population and the scattered nature of its distribution imply that the per capita investment costs for economic and social infrastructure, whether it is the building of roads, hospitals and schools, or the training of engineers, doctors and midwives, will necessarily be very high.

The great ethnic diversity of the population poses other problems. Variations in cultural and religious practices and linguistic diversity can be problematic when it comes to the implementation of national-based development programmes. Even though the authorities may consider them appropriate to their local communities, programmes, including health and educational services, which are deemed culturally unacceptable or construed as culturally threatening will not be utilized by the intended beneficiaries. Hence, governments of very diverse societies are often faced with balancing national and local or ethnic interests in development planning -- an exercise which calls for great cultural sensitivity on the part of the political authorities and the implemental agencies. However, this also invariably involves much greater investment of time, energy and resources for programme planning and implementation.

The demographic structure of Lao PDR also resembles that of most Third World countries; that is, it is characteristically young and growing very rapidly. At present, children below 15 years of age make up nearly half of the total population. Females, more than 45% of whom are within the reproductive age group, constitute 51.0% of the population (Table 2).

The population is currently estimated to be growing at 2.9% per year, one of the fastest growing populations in the region. The government of Lao PDR regards rapid population growth as a welcome phenomenon because of the small size of population in relation to land. It also believes that a larger population is needed in the country for both national defense and economic development. Hence the government's population policy is explicitly pronatalist and the import of contraceptive is discouraged. This policy, together with the already existing central tendencies towards large families, has resulted in very

high fertility rates. Crude birth rates are estimated to be above 46 per thousand population and the total fertility rate per woman is about 6.2.

The high crude birth rate in Laos is also matched by a high crude death rate (per thousand) relative to the age structure of the population. This high crude death rate is almost twice that of most other countries with an equivalent age structure and a similar level of development.

2-3. The Economy

While the demands for all kinds of services are great economically, Lao PDR is also one of the poorest countries in the region. Per capita GNP in 1985 is estimated to be US\$ 135 (1986 World Bank estimate). In terms of growth, the economy grew at 7% per year in real terms between 1977-1980 due largely to the postwar recovery and expansion of the agricultural sector. Between 1981 and 1984, the rate of growth slowed to 5% per year and agriculture continued to be the main source of this growth.

In terms of GDP (Gross domestic product) contribution, that in 1985 was 600,000,000 US\$, while national per capita income was 157 US\$ in the same year and 202 \$ in 1987. Average GDP growth between 1982-1986 was 7%, rate of agricultural product per GDP was as high as 62.5%, that of industrial product was as low as 5.6%. The increase of consumer price was 22.65% in 1986, and that in 1987 was estimated to be a similar level. Foreign currency reserves estimated by some western ambassadors were 20,000,000 \$ in 1986, and 16,150,000 \$ in 1987. The fiscal year follows a calendar year. Totals of national budget and the expenditure are not published. The economy is largely dependent on agriculture (Table 3) which account for more than 60% of GDP, stated above, and provided employment for more than three-quarters of its population. This agriculture activity is largely for subsistence and there is still little diversification into cash crop production. Nonetheless, government emphasis on agriculture in recent year was the major factor in the country's attainment of national rice self-sufficiency in 1984. This has enabled the Lao PDR to attain

some degree of basic food security for the first time in recent decades. However, a drought like those in 1977 and 1978 would result in a sudden drop of agricultural product, so the rice self-sufficiency is still unstable.

Industry, trade, construction, and transportation and communication constitute the other major sectors of the economy, although together they contributed only about 20% to total GDP in 1985. Industry was responsible for less than 6% of GDP and employed a little over 1% of the labour force. Construction accounted for another 4%, and trade another 9% of GDP. After some initial postwar growth, all these sectors have stagnated or recorded little growth since 1981 despite heavy state investment. Manufacturing, for example, fell by 40% between 1981 and 1984, and despite growth in mining and electricity, total industrial growth fell about 2.6% per year in constant price between 1981 and 1984.

Main products of agriculture are rice, sweet corn, tobacco, coffee, cotton, lacquer, wood, cow, sheep, pig, and leather. Wood is an important resource for export, but recent reckless deforestation for export is criticized by world public opinion.

Regarding the mineral industry, much deposit of mineral resources are expected in the land of Lao PDR, but only tin and gypsum were found and developed for production. Only consuming goods and handicrafts are industrial products. Exports from Laos are limited to tin, wood, coffee, handcraft and electricity. Main export of Laos is electricity produced in Namugmu Dam to Thailand. One hundred thousand Kw of 150 thousand Kw electricity produced is exported to Thailand.

With little surplus, there is also little for exchange or trade. Total export earnings in the Lao PDR covered only on average 27% of imports from 1981 to 1984. The evolution of the balance of payments during the 1981-85 period was therefore marked by a widening of the current account deficit which grew from 69 million US\$ in 1983 to 95 million US\$ in 1985. To finance this current account deficit, the Lao PDR

depends upon bilateral and multilateral assistance from both the convertible and non-convertible currency area.

In 1988, Japanese export for Laos was 19.7 million US\$ (28% increase compared to last year), while import from Laos was 7 million \$ (36% increase); the exports were cars, iron and steel manufacturing goods, and machines, while the main import from Laos was wood (Table 4, and 5).

Table 3. Economic Structure and GDP Growth (1977~1984)

	1977	1982	1984
	(In percentage of GDP)		
Agriculture	59.0	62.0	62.5
Industry & forestry	6.0	6.5	5.6
Construction	9.3	3.3	4.2
Transport & Communication	7.9)	1.5	1.4
Trade		9.1	8.8
Government & Other services	17.8	17.6	17.5
Total	100.0	100.0	100.0

Source: UNICEF

Table 4. Export & Import of Laos (millionus \$)

I/ears	Total of Trade		Trade with Japan	
	Export	Import	Export	Import
84	45.1	153.9	0.633	5.171
85	47.6	163.3	1.331	11.738
86	58.5	205.0	1.372	5.702
87	—	—	0.861	10.262

Source: Japan Ministry of Foreign Affairs

Table 5. Annual trade of Japan with Laos (million us \$)

	Export with Laos	Import with Laos
1975	4.1	1.5
1976	7.3	2.9
1977	14.5	2.5
1978	4.7	4.4
1979	9.2	9.2
1980	12.5	5.9
1981	9.0	3.8
1982	9.8	1.2
1983	15.2	2.4
1984	5.2	0.6
1985	11.7	1.3
1986	12.9	1.4
1987	15.4	1.5
1988	19.7	7.0

source : Japan Ministry of Foreign Affairs

3. PRESENT STATUS OF HEALTH AND MEDICINE

3-1. General

Estimated population of Lao PDR is 3.9 million in 1988, and birthrate 50 per thousand; crude death rate 17 per thousand, annual growth rate of population average 2.9%; expected life is 50 years, mortality of infant 104 per 1,000 births; calorie intaken daily is 1,842 cal (1987); protein intaken daily is 477 g in 1987; literacy rate of adult 85% in 1987; manpower number per 10,000 population is; doctors 2.5, assistant doctors 8.3, and nurses 20.3.

The administrative structure of Lao PDR Ministry of health and Welfare is indicated in Figure 1. It is noteworthy that the minister supervises the medical, dental and pharmaceutical school.

In Table 6, numbers of medical facilities such as hospital and dispensaries, and beds are shown. Total number of doctors, assistant doctors and nurses in 1987 are 901, 2,977, and 7,882, respectively.

Main infectious diseases of Lao PDR are shown in Table 7.

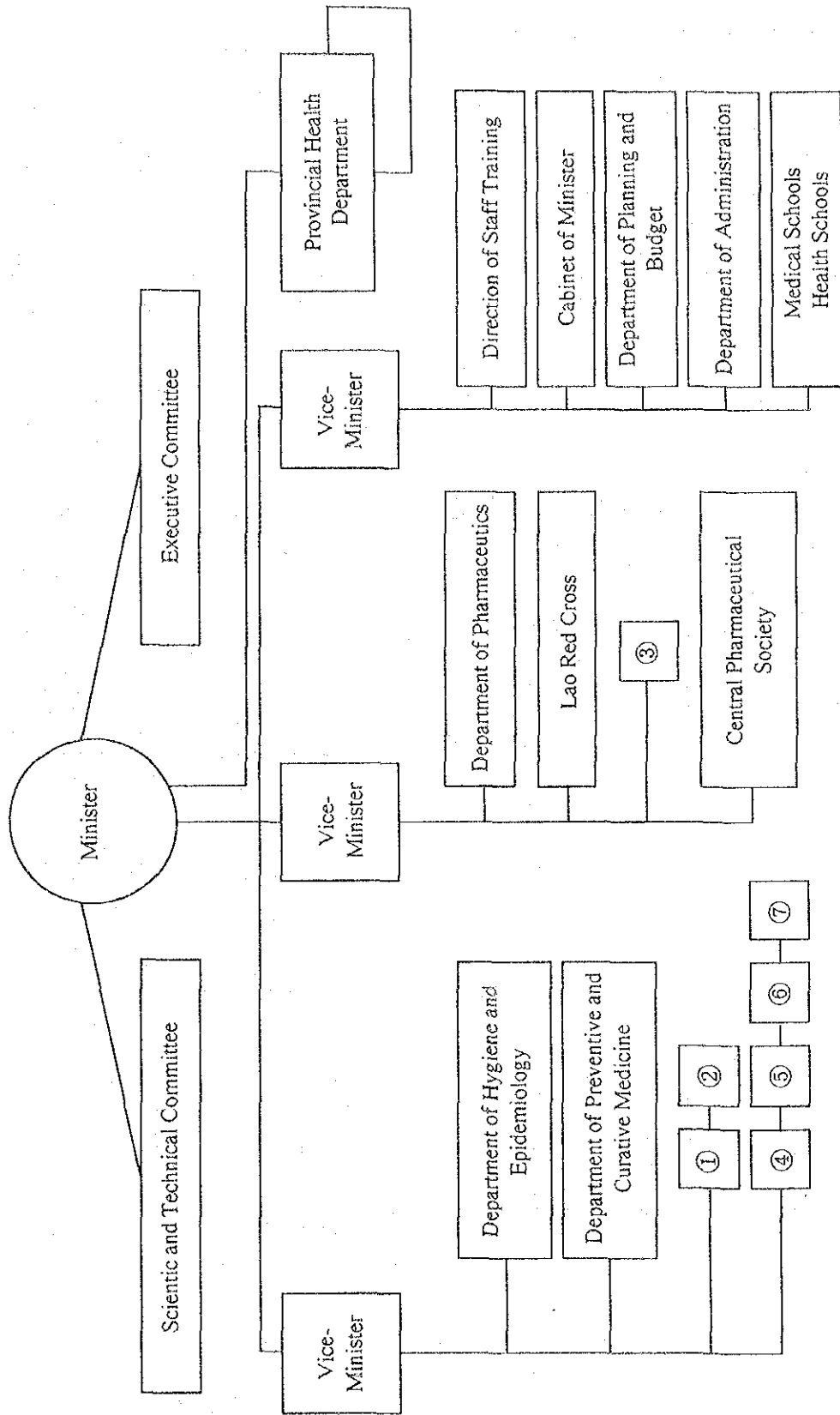
3-2. Mortality

The mortality situation of a population is the best indicator of health. For the Lao PDR the mortality situation is not favorable as there is high mortality (crude death rate of 17 per thousand) and morbidity and a low expectation of life (49 years for men and 52 for women). Children, in particular, are victims of very high infant and child mortality and morbidity rates.

(1) Infant Mortality

In 1985 there were about 620,000 children aged 0-4 in Laos. Approximately 100,000 babies are born each year. The official statistic for infant mortality is 117 per thousand live births. This ranks Laos PDR 29th highest among all countries in the world in terms of IMR (infant mortality rate). In more concrete terms, nearly 12 out of every 100 babies born do not survive the first year of life. Based on United

Fig. 1 Lao People's Democratic Republic
Ministry of Health & Welfare



Remarks:

1. Institute of Malaria
 2. Institute of Hygiene and Epidemiology
 3. Research Institute of Traditional Drugs
 4. Hospital No. 1
 5. Mahost Hospital
 6. Leprosy
 7. Center for Rehabilitation of Disabled
- The Ministry includes 176 personnel (exclusive of Centers, Institutes, Hospitals, Schools and Societies).

Source: National Plan for the Control of Diarrhoeal Diseases in the Lao people's Democratic Republic.

Table 6. Numbers of Hospitals and beds

Level	Facilities	Beds
Central	4 Hospitals	600
Provinces	16 Hospitals	1958
Districts	112 District hospitals	2963
Communes	1,362 Dispensaries/health posts	4678

Source MOH of Lao PDR

Table 7. Infectious Diseases in Lao PDR

Acute Respiratory Infections	5386
Diarrhoeal Diseases	3725
Malaria	3289
Dengue Haemorrhagic Fevers	660
Hepatitis	370
Tuberculosis	195
Measles	145
Meningitis	60
Pertussis	55
Trachoma	44

Based on 1987 data, communicable diseases are the leading cause of morbidity, morbidity rates.
Source, MOH of Lao PDR

Nations estimates, the Under-five Mortality Rate (U5MR) in Laos is around 170 per thousand live births. Recently Minister of Health data showed that the estimated child death rate for 1-4 years-olds per 1,000 live births is 75, indicating that the U5MR is actually even higher, at 192 per thousand live births. This means that infant deaths account for 67.4% of all deaths 0-4 years of age.

Comparing these figures with those of neighbouring countries, the IMR and U5MR of Laos are 262% and 320% higher than those of Thailand, and 157% and 192% higher than those of Viet Nam, respectively. Table 8 gives the mortality indicators of Laos, as compared to some selected countries in Southeast Asia and Asia to illustrate the general mortality conditions which affect women and children in the country.

(2) Trend in Infant Mortality

Infant mortality is a sensitive indicator of child well-being for it is a summary measure of the individual's (or household's) and communities socio-economic welfare. Analysis of trends in IMR is therefore a good proxy measure of the improvement, stagnation, or deterioration of socio-economic factors. Table 9 shows the decline of IMR of some selected countries over the period 1969-1980. As can be seen, while most countries shown in the Table 9 started at about the same level of IMR in 1960, the rate of decline is the slowest. Between 1960 and 1970, the IMR in Laos declined by only 6.5%, and between 1970-1980 by another 10.3%, as compared with decreases of between 15-35% over the same period for the other countries. Part of the reason for this phenomenon is attributed to the political instability in Laos throughout the 1960s and the early 1970s which hampered all aspects of social development. However, the general level of underdevelopment and the relatively poor conditions of the health system also accounted for the slow decline IMR in Laos. According to WHO report, improvement of infant mortality from 1960 to 1988 is shown as follow:

Infant Mortality Rates in Laos

1960	1970	1980	1985	1988
153	145	130	104	100

Table 8. Mortality indicators of the Lao PDR and Selected Southeast Asian
and South Asian Countries

Countries	Crude Death Rate (per thousand population)	IMR (per thousand live births)	U-5MR (per thousand live births)	Life Expectancy (Years)
Lao PDR ¹	17	118	192	50
Thailand ²	8	45	60	62
Viet Nam ²	11	75	100	57
Burma ²	12	70	95	56
Indonesia ²	14	80	130	52
India ²	13	105	165	54
Sri Lanka ²	7	38	50	68

Source:

1. Government Statistics (1985)
2. Statistics on Children in UNICEF-Assisted Countries, 1986.

(Data refer to 1980), UNICEF

Table 9. Recent IMR Decline in Selected Countries

Countries	IMR	IMR	IMR	Rate of Decline (Percent)	
	1960	1970	1980	1960-1970	1970-1980
Lao PDR	155	145	130	6.5	10.3
Viet Nam	155	125	85	19.4	32.0
Burma	155	100	70	35.5	30.0
Indonesia	140	110	90	21.4	18.2
India	165	140	120	15.2	14.3

Source: Statistics on Children in UNICEF - Assisted Countries, 1986

UNICEF

(3) Regional Variations in IMR

Although data on regional variations of infant mortality are scarce, it is clear that infant mortality is not uniform throughout the country. Babies born in the urban areas in Vientiane or the major provincial cities have a chance of survival more than those born in the rural areas of the upland provinces. Infant mortality statistics collected in 19 MCH clinics assisted by the Save the Children Fund in Vientiane Municipality and Vientiane Province, for an example, showed that infant deaths in these areas were between 22% to 29% lower than the national figure (IMR of 83 per thousand of Vientiane Municipality and 92 per thousand for Vientiane Province). In contrast, as revealed by a recent FAO sponsored survey, infant deaths per thousand live births in rural villages in Vientiane, Luang Prabang and Champassak ranged from 100 to 126. In yet more remote upland districts of the country, the rates were much higher. In certain districts of Bokeo, an upland province with large concentrations of ethnic minorities, it was found that nearly three out of every ten babies born died before one year (IMR 299 per thousand). These variations suggest that districts which are better developed tend to exhibit lower infant mortality rates.

3-3. Morbidity

(1) Child Morbidity and Mortality

Children in the LAO PDR are exposed to endemic, transmissible, respiratory and gastrointestinal diseases from birth. Malaria is reported by Lao medical authorities as the number one killer and is endemic throughout the region. Dengue fever, also a mosquito-borne disease, is on the rise. Diseases like tetanus, diphtheria, typhoid, measles, polio and tuberculosis are rampant and exact their toll especially among the children under fives. In addition, diarrhoea diseases, skin and eye infections and other parasitic infections are common. While not immediately fatal, they weaken the afflicted and contribute to the general ill health and high morbidity of infants and children.

Although it is generally known that many children are taken ill each year, statistically grounded national level age-specific causes of death and morbidity profiles of children are not readily available. There exist only very limited micro-level surveys and data drawn from hospital and clinical records to provide a very sketchy picture of the morbidity and mortality situation of Lao children.

Examination of hospital records from the Central Mahosot Hospital in Vientiane and two provincial hospitals of Savannakhet and Paksane confirms that the most frequently hospitalized cases are those suffering from malaria, pneumonia, diarrhoea and tuberculosis (Table 10). While the data may not represent the absolute magnitude of occurrences of these diseases, they are indicative of their seriousness and do show trends.

More significantly, the data demonstrate that young children are the most susceptible victims of these diseases. In central Mahosot Hospital, 82% of all diarrhoeal cases, 74% of those suffering from pneumonia, and 79% of all tetanus patients for the period 1980-1985 were children below the age of 5. More than one third of all cases of diarrhoeal diseases, one quarter of pneumonia, and 72% of tetanus are infants less than one year (Table 11).

(2) Diarrhoea

Available child morbidity data indicate that diarrhoea and amebiasis incidences are alarmingly high and especially serious among children. The average episode rate per child per year is estimated to be about 3.4 among the 0-4 age group and 5.0 for those below age one. The remote countryside rate is believed to be higher. Some people report that random interviews of some mothers by UNICEF field staff. Diarrhoea is therefore reported to be the single most important cause of child morbidity in LAO PDR.

(3) Malaria

Table 10. DISEASES MOST FREQUENTLY REQUIRING ADMISSION
TO THREE MAJOR HOSPITALS

Number of Cases

Hospital	Year	Diarrhoeal Diseases	Pneumonia	Malaria	Tuber - culosis
Mahosot Hospital	1980	846	719	467	214
	1981	555	726	530	172
	1982	539	800	450	204
	1983	578	553	522	172
	1984	407	615	628	126
Pakse Hospital	1985	643	714	1,191*	228
	1984	247	137	521	80
Savannakhet Hospital	1985	164	231	2,963*	402
	1985	83	53	1,288*	32

Source : Ministry of Health, UNICEF

* The steep rise of malaria cases in 1985 was due to an epidemic outbreak of malaria and dengue fever that year

Table 11. PERCENTAGE OF CHILD CASES (SELECTED DISEASES) IN
MAHOSOT HOSPITAL, VIENTIANE (1985)

(percent)

Diseases	< 15 Years	5 - 14 Years	1 - 4 Years	< 1 Years	Total Cases
Diarrhoea	90 %	8 %	47 %	35 %	643
Pneumonia	90	16	48	26	714
Tetanus	86	7	7	72	14

Source : Ministry of Health, UNICEF

Although Lao medical authorities claim that malaria is the greatest killer in the country, the morbidity and mortality data base for malaria is not complete. A 1985 malaria survey conducted in 20 villages in the Muong Hon District in Vientiane Province showed that of 3,192 people tested, 37.3% had enlarged spleens and 15.6% had positive plasmodic indications. The rates are even higher for children. Of the 1,046 children aged 2-9 years tested, 411 (39.3%) had enlarged spleens and 203 (19.4%) had positive plasmodic indications. In other words, nearly 4 out of every 10 children in these villages had malaria and nearly 2 out of every ten were then suffering from malaria. In 4 of the villages, the incidence of children with enlarged spleens exceeded 70%, and in 2 of the villages more than 40% of the children showed positive plasmodic indications. The malaria incidence of the Muong Hon district is probably not unique and is representative of the scale of the malaria problem in mountainous districts of the country.

(4) Other Diseases

Information on other childhood diseases is less. The available data also tend to confirm high incidence of measles, but fatality rates are reported to be low. Pertussis and diphtheria are said to be frequently reported, but laboratory facilities have not been established. Poliomyelitis is believed not to be very widespread, but children under three are reported to be more susceptible to diseases more than older children. As for neonatal tetanus, it is thought to be the single most important cause of death among children from the fourth to the thirtieth day of life. There are 1 - 2 cases of rabies in Vientiane city, while bite by snake with poison is few only in the mountainside.

(5) Maternal Morbidity and Mortality

As data on adult morbidity and mortality are even more scarce, there is no information available. However, given the birth practices prevailing in the countryside, the poor sanitary conditions and low rates of immunization against tetanus among pregnant women, it is suspected that maternal mortality due to puerperal causes is high. Also given the close birth spacing and general unsatisfactory maternal

nutritional status, it may be assumed that these women too are prone to tuberculosis, malaria, diarrhoea, and other common diseases.

4. HEALTH ORGANIZATION AND SERVICES

4-1. Organization of Health Care

The level and efficiency of a country's health service is one, albeit not necessarily the most important, determinant of the morbidity and mortality situation of children and women. Laos government has stated its commitment to improve health services and health care for the population.

In the last ten years, there has been an increase in the number of health facilities constructed and health personnel trained. This has led to an improvement of the ratio of medical facilities and personnel to population (Table 12). Nationwide, health services are now provided through 4 central, 16 provincial and 111 district hospitals, and 741 sub-district (or commune) dispensaries. In addition, there are 6,000 village health posts. A total of some 550 doctors, 2,200 assistant doctors and 6,700 nurses as well as an unknown number of auxiliary health personnel work to provide health care for the country's 3.6 million population. However, in terms of health needs for the people, the supply is still very inadequate.

Theoretically, the village health posts are manned by one or two voluntary "health promoters" who can provide some basic first aid and health information. The sub-district or commune dispensaries are operated by a traditional doctor, a paramedic and one or two nurses. One level up, the district hospital is equipped with 30-50 beds and run by one or two paramedics, a few nurses and a traditional doctor or assistant doctor. In Xieng Ngeuane district hospital, where we have been for examination, there is a doctor in addition to other medical staff. Provincial hospitals are staffed by general practitioners and nurses who take charge of 100-150 beds.

Table 12. AVERAGE NUMBER OF DOCTORS, ASSISTANT DOCTORS
AND BEDS PER 100,000 INHABITANTS (1976 - 1988)

Year	Doctors	Assistant Doctors	Beds
1976	0.31 (90)	1.28	21.4
1977	0.25	1.49	23.6
1978	0.42	2.31	28.6
1979	0.47	2.36	31.6
1980	0.54	2.64	30.7
1981	0.57	2.66	30.9
1982	0.67	3.12	30.3
1983	0.92	4.65	25.1
1984	1.18	5.35	25.4
1985	1.52 (550)	5.77 (2,200)	27.6
1987	2.5 (801)	8.3 (2,977)	28.5
1988	2.7 (1,082)	8.3 (3,261)	28.5

Source : 10 Years of Socio - Economic Development in the Lao People's Democratic Republic, 1985.

: UNICEF

: NIHE those in 1987, 1988.

This decentralized health network, in theory, has the potential of becoming an effective health delivery system, but in practice, it remains at an embryonic stage. Lack of supervisory and trained manpower, lack of essential drugs, basic equipment, administrative and financial support have constrained the effective delivery of health services at every level, particularly from the district level down. For example, many districts do not pay their local district health cadres because of the lack of funds.

The general low efficiency and capacity of the health system reflect the underdeveloped and impoverished state of the country. The health sector was allocated 5.2% of development expenditure during the 1981-85 Plan period, which was higher than education, but much lower than other economic-related sectors. In 1988, the budget of the same sector is 8.0% of the total national budget and that is higher than the former period.

4-2. Health Intervention Program

In the context of health care in Lao PDR, the most relevant intervention program for women and children are primary health care (PHC), mother and child health care (MCH), immunization (EPI), and control of diarrhoea (CDD) and malaria.

(1) Primary Health Care

Recognizing the limited financial and material resources of the country, the health system is designated to provide basic services. It is meant to focus on the primary health care network through which basic services like immunization, control of diarrhoeal diseases, mother and child health, health education on disease prevention and environmental hygiene and sanitation, are provided. But as mentioned earlier, the health organizational structure is still weak, and proper implementation of PHC both as a concept and as a service has been slow.

However, with the strengthening of the health structures, especially at the village, sub-district and district levels, with adequate training of health personnel (especially mid-wives, traditional birth attendants (TBAs), and village health workers), and with appropriate supplies and equipment, as well as mass media support and community participation, primary health care can become a reality in the Laos PDR. UNICEF, WHO and Japan are providing material, technical and financial assistance to help strengthen the system.

(2) Mother and Child Care

Mother and child care is an integral part of the primary health care system. Organizationally, MCH activities are under the MCH department of the Ministry of Health. The overall objectives are to improve the health status of mothers and children through close collaboration with disease control programmes (malaria, EPI, CDD, eye care etc.), nutrition and health education, and health manpower training, especially in the area of TBA training.

MCH clinics have been established in the two main teaching hospitals in Vientiane, all seven districts in the Municipality of Vientiane (33 of the 49 communes of Vientiane Province, and at the central level in the Provinces of Savannakhet, Pakse, Khammouane and Luang Prabang. Vientiane Province and Vientiane Municipality with a total of 41 MCH clinics are much better served by MCH services than any of the other provinces.

The main support of MCH activities has come from SCF, WHO and UNICEF. The Save the Children Fund, through its nurse-tutor, has provided most of the training and supervision for the programme. However, SCF activities are confined only to the MCH clinics in Vientiane Municipality and Vientiane Province. All these clinics offer prenatal and postnatal care for women and health care for children, including vaccination, diarrhoea control and health monitoring through the use of "road to health Charts". In addition, nutritional and health education and advice for mothers are provided. Recently, in

some of the larger clinics, food preparation demonstrations for weaning children have also started.

According to statistical returns of the MCH clinics assisted by the Save the Children Fund, MCH coverage is quite high. It is estimated that MCH service is now available to 67% of the population in the Municipality of Vientiane, with the more established clinics showing excellent coverage rates. This is an encouraging sign as it shows that when the clinics are well organized, the services are sought after by mothers and children. However, apart from the MCH clinics in Vientiane Municipality and some districts in Vientiane Province, progress in MCH services is slow with MCH activities still relatively undeveloped or underdeveloped. In these clinics the same problems affecting PHC also apply to MCH.

(3) Control of Diarrhoeal Diseases

The Control of Diarrhoeal Diseases (CDD) programme is being developed as an integral part of primary health care. A national CDD coordination committee has been set up in collaboration with EPI and MCH under the leadership of no less than a vice-minister of the Ministry of health. The purpose is for these activities to be integrated in the field. The main objective of the programme was to reduce mortality due to diarrhoeal diseases for personnel, distribution of ORS and diffusion of techniques for preparation of home-based ORS.

So far, proper evaluation of the programme is lacking. As no reporting system exists, data are available only on costs of inputs and distribution of ORS packets, but little on use. Where data on ORS use are available, they sometimes conflict. UNICEF field reports seem to suggest that use of ORS is increasing. However, in a recent Save to Children fund survey of mothers visiting the MCH clinics in Vientiane Municipality and Vientiane Province, it was stated that ORS was not even mentioned as one of the methods used for treating diarrhoea. This finding is significant in that CDD linkages with MCH services for the promotion of ORS or home-made ORS are still weak.

(4) Malaria Control

As has been shown earlier, malaria is a very serious problem which afflicts large numbers of children as well as adults. Research on malaria and training of personnel for malaria control is under the Institute of Malaria and Parasitic Diseases of Ministry of Health. However because of limited manpower and funds, activities for malaria detection and control are very limited. At present malaria surveillance and control cover Vientiane Province, Vientiane Municipality, Savannakhet, Champassak, Luang Prabang, Sayaboury, and Borikhamxay.

WHO in collaboration with UNICEF, has developed a joint malaria control project to benefit initially 500,000 persons in the endemic area and progressively to cover the entire country through coordination with PHC. The project essentially consists of the training of technicians (microscopists) in simple diagnosis. Preventive measures are to be especially emphasized through environmental sanitation and use of mosquito nets.

The magnitude of the problem is obvious, the programme so far is too inadequate to make any impact and calls for much stronger action, which should include a mass-based environmental campaign aimed at mosquito control. It is also recommended that health education must be reinforced regularly and systematically. As the problem of malaria is endemic in the region, proper coordination of malaria control efforts with the bordering countries, especially Kamupueha, Thailand and Viet Nam, is not only preferable but essential.

4-3. PROGRAM CONSTRAINTS

Progress on all the health programs which can benefit children and women is hindered by the same fundamental constraints which include:

a) Lack of Political Will

The social service sectors, including health, water and environmental sanitation, are not the country's political priorities, rather, agriculture, industry, transportation, and communications are the key sectors which occupy greatest government attention at this stage of the country's development. However, quite clearly, for many of the health programmes, such as EPI, CDD and malaria control to succeed, political commitment can be mobilized, as is evident in the achievement of rice self-sufficiency. In other words, if a similar commitment is made by the government in the area of health, many of the difficulties encountered in the health programmes can be overcome. For example, immunization is one area in which a greater degree of political commitment could clearly make a difference. As has been shown in the 1985 Save the Children Fund sponsored Logistic and Cold Chain survey, there is more than ample vaccine and adequate cold chain equipment to meet the immunization targets set by the government. Hence, there is no reason why, with better coordination and better management, EPI can not progress in Lao PDR. The same applies to the control of diarrhoeal diseases and malaria.

Like other socialist countries, the Lao PDR government has well organized mass-based organizations (such as the youth organization, women's union, farmers' organization and trade unions), which have the capacity to mobilize the population from the centre down to grassroot levels. This capacity was clearly demonstrated last year when the government decided to conduct its first-ever modern census. A similar effort could ensure immunization of all children and women in the Lao PDR by 1990 and a substantial reduction in malaria-related mortality and morbidity within the same period.

b) Poor Health Infrastructure

However, the health system does have to contend with the problems of a very weak infrastructural base. Despite efforts made, the material conditions of the health facilities (central and provincial hospitals, districts and sub-district dispensaries) are all extremely poor. In the rural areas, many clinics do not have proper walls or roofs.

Most have no water and sanitation facilities. they are normally supplied with only limited medical equipment and few medicines. Many of these problem are exacerbated by poor transportation and communication, and lack of electricity, leading to delays in the delivery of supplies, poor maintenance of medical equipment and stock, and poor supervision of the staff. The staff also lack training and motivation and hence some rural clinics do not stay open to operate with any regularity. The level and quality of service are therefore low, which in turn contributes to poor community response and low user rates.

The conditions of the central and provincial hospitals are sometimes not much better. Administrative support is weak, medical equipment and storage facilities are often broken down and in disrepair, and drugs and medicines are improperly stored and poorly managed. There is also an acute shortage of all kinds of essential medicines and supplies. Even bandage and syringes are reported to be recycled and reused. In the central Mahosot Hospital in Vientiane, some patients reported that they are required to get their own medicine from outside as the hospital often runs out of drugs needed for treatment.

To strengthen the health infrastructure many of the health facilities will have to be rehabilitated. Despite receiving external assistance from a number of agencies, including UNICEF and WHO, the lack of funds continues to pose a major problem.

c) Manpower

The weakness of the health infrastructure can be attributed to the lack of health manpower. It is difficult to over-emphasize the problem of manpower in the context of the Laos PDR. Qualified health manpower is rare and in spite of the effort made to train health personnel in the last ten years, the supply is much lower than the demand. In the remote mountain provinces of Phongsaly, Luang NamTha, Saravane, Sekong and Atapeu, there are only 2 or 3 trained doctors and no more than 15-20 assistant doctors to administer to the

needs of the entire province. Those who are efficient are often severely overlooked and are frequently discouraged by the lack of support. Others are untrained, inadequately trained or inappropriately trained thereby affecting the efficiency of most health projects. Finding the most effective way to train large numbers of health workers at every level within the shortest possible period remains a major task for the health system.

d) Lack of Coordination

Another problem with the health system is the notable lack of coordination between the different health programmes.

Although theoretically MCH, EPI, CDD and Malaria Control are all supposed to be integrated services, this is not the case in practice. MCH workers, for example, are not always trained to vaccinate, even though EPI is supposed to be an integral part of MCH services. Thus valuable opportunities are being lost to vaccinate children in the MCH clinics.

Lack of coordination also exists between the different ministries or even sections within the same ministry responsible for the various services in health, water and sanitation. This often leads to delayed action as the lines of responsibility and communication are not entirely clear to the section/unit headed by themselves. Instead of taking immediate action, the pattern is to procrastinate and await decision at the higher levels.

e) Lack of Community Participation

The success of any health system depends not on the level and efficiency of the delivery system, but also on local participation and cooperation. In many of the health programmes, especially EPI, the local community shows little enthusiasm. Poor community response is due in part to the poor level of service for example, clinics are not open regularly, patients are turned away because of lack of drugs or because vaccinators refuse to open new vaccine vials for one or two children),

and in part, to the local people's lack of understanding of importance and benefits of the health programmes. The local people are seldom given the type of information they need. Lack of information about both the benefits and side effects of immunization is the single most important factor which accounts for the low coverage and high drop-out rates for vaccination among children.

Another factor for low utilization is related to the poverty level of many households. Although health care is in principle free, some actual or latent costs are involved. Travel to the local village or commune health posts may incur too much cost, but if medical attention is needed from facilities further afield, like a provincial hospital or even the central hospital in Vientiane, then travel expenses become a limiting factor. Also, as indicated earlier medicines are not usually available even from the larger medical facilities. There may be additional costs for medicines. As all medicines are scarce and are imported, they are very expensive when purchased from the private market. Therefore the costs of utilizing these medical services may be so prohibitive to poor families that they may prefer to resort to traditional medicines and home brews.

However, poor community response is also partly attributed to the low level of education. Lack of education often inhibits understanding of modern medicine.

Many village people have only a vague conception of the linkages between sickness, medicine and disease prevention. Hence many still have greater faith in traditional healers and monks than in the government health programmes. It is therefore not surprising that people are sceptical about immunization or CDD or malaria control.

To overcome the local communities' inertia towards modern medicine and disease prevention. The implementation of health programmes should be preceded by basic health awareness campaign to sensitize the population to the importance and benefits of these programmes. Also, given the elevated status of the religious leaders and traditional healers in the community, and the faith people have in

them, it is imperative that the support of these individuals be enlisted at the onset and their cooperation sought to ensure high community participation.

5. EXPANDED PROGRAM ON IMMUNIZATION

5-1. EPI Program

Immunization is the most effective way of reducing mortality and morbidity caused by six major childhood diseases; tetanus, diphtheria, poliomyelitis, pertussis, measles and tuberculosis. In Table 13, the vaccines used in EPI and their administering schedules are shown. Immunization rates are very low in the beginning of 1980's and account for the high susceptibility of children to these diseases. Nationwide, only an estimated 2-3 % of children 12-23 months age are fully immunized; 10-12 % are vaccinated against TB; 2-5 % against DPT and poliomyelitis; and 4 % against measles. And only 6-10 % of women are vaccinated against tetanus.

Plans to develop an EPI programme were drawn up by the Laos government in collaboration with UNICEF and WHO in 1979, resulting in a 1979-81 EPI plan of operations. This plan proved to be ambitious and was subsequently re-evaluated and scaled down and a new 1982-86 programme was formulated. Under the 1982-86 programme, the population with access to EPI was to increase from 358,000 in 1982 to 645,000 in 1983 and 1,595,000 in 1985. It was intended to cover 10 districts in 2 provinces first and subsequently to extend to 46 districts in 9 provinces by 1985. The programme aimed to provide immunization for;

50 % of children less than 1 year of age against DPT-Polio, TB and measles,

80 % of children 6-8 years against TB (BCG),

50 % of women from 15-45 against tetanus,

50 % of pregnant women against tetanus,

Table 13. Immunization Schedules

Vaccine	Minimum age for administration	No. of doses and interval	Technique *	Dose
BCG	Birth (6-8 y. booster)	1 dose	ID	0.005ml
OPV ₃	6 weeks	3 dose (1 month interval)	Oral	3 drops
DPT ₃	6 weeks	3 dose (1 month interval)	IM	0.5ml
Measles	9 months	1 dose	SC	0.5ml
TT	Pregnant women and women 15-49 years old	2 dose (1 month interval)	IM	0.5ml

IM intramuscular; ID Intradermal; SC Subcutaneous

Source: NIHE

Table 14. EPI: Planned Targets and Actual Achievements (1984/1985)

Vaccines	Total Target Population (in thousands)			Percent ¹			Dropout Rate
	Original	Revised	Actual	R/O	A/O	A/R	
BCG 1	32.0	14.2	10.7	44	33	75	-
BCG 6-8	140.3	29.0	13.0	21	9	45	-
Measles	32.0	10.7	5.7	33	18	54	-
DPT 1	32.0	14.2	9.2	44	21	65	18
DPT 3	32.0	14.2	7.5	44	24	53	-
Polio 1	32.0	14.2	9.4	44	30	67	21
Polio 2	32.0	14.2	7.5	44	23	53	-
TT Women 1	143.5	63.9	30.7	45	21	48	6
TT Women 2	143.5	63.9	28.5	45	20	45	-
TT pregnant Women	32.2	14.2	7.5	44	23	53	15
TT pregnant Women	32.2	14.2	6.3	44	20	45	-

1. R/O = Revised Target/Original Target
 A/O = Actual Achievement/Original Target
 A/R = Actual Achievement/Revised Target

Source: UNICEF

Table 15. Percentage of EPI Coverage in to EPI Areas (1984)

EPI Areas	Percent																
	BCG 1			BCG 2			Measle			DPT		Polio		TTW		TTP	
	70	84	72	61	39	89	39	36	30	64	56	1	2	1	2		
Sayaboury	70	84	72	61	39	89	39	36	30	64	56						
Vientiane Municipality	77	41	51	64	57	64	57	48	46	56	49						
Paksan	60	78	86	60	50	60	50	43	36	18	18						
Savannakhet	61	47	84	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	90	70						
Phonethong	28	83	98	91	41	91	41	61	53	38	35						
Pakse	51	41	48	51	41	51	41	58	46	n. a.	n. a.						
Sanasomboun	38	18	84	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.						
Thakhek	70	51	39	96	83	96	83	54	50	81	57						
Luang Prabang	63	18	22	51	19	51	19	8	33	39	27						
Xieng Khouang	67	80	91	85	54	85	54	69	55	24	13						

BCG 1 = BCG 1 year
 BCG 2 = BCG 6 - 8 years
 TTW = TT Women
 TTP = TT Pregnant Women

Source : UNICEF

Table 14 summarizes achievement of EPI coverage in relation to the set targets for 1984/85. As can be seen the achievement falls far short of the targets, even after the original targets were revised downwards. (Based on the 1982/83 experience, the health authorities revised the original target population down by 55-80 % (BCG under 1 year, DPT, Polio and TT down 55 %; measles down 66 %, and BCG 6-8 year down 80 %). In spite of the considerable reduction of the target population, the vaccination rate is between 45-55 % in the majority of cases, except for BCG under 1 year where 75 % of the target infants were vaccinated. The drop-out rates between the first and third vaccination are quite high for polio (21 %) and DPT (18 %) and relatively low for TT (pregnant women 15 % and 15-45 women 6 %). These variations can be explained by the number of shots needed in the series, such as 3 for polio and DPT and 2 for TT.

As there is considerable variation in access as well as community response to immunization in the country, regional variations in vaccination coverage are great. The more remote the districts, the lower will be the coverage and the higher the drop-out rates. Table 15 shows regional variations in immunization coverage rates in the ten EPI districts. It is clear that districts in the northern part of the country like Luang Prabang and Xieng Khouang have the lowest coverage and highest drop-out rates. These are upland districts with considerable minority populations which are hard to reach. During the rainy season these are completely inaccessible. In the central and southern districts of Vientiane, Pasan, Thakhek and Pakse coverage rates are better and problems with drop-outs less serious. In these districts, apart from better access, it is felt that better receptivity towards EPI programme probably accounted for the higher community participation.

In 1987, the strengthened EPI program started. Table 16 shows the coverage rates of EPI from 1983 to 1988. The figures of rates are much different from those mentioned in the Tables above, because total numbers of nationwide children and women in corresponding ages were used as the denominator. Marked increase of coverage rates were found during recent years. Table 17 shows recent data of the rates of

Table 16. Immunization Coverage Rates from 1983 - 1988 Nationwide (percent)

Year	Measles 9 - 23 years old	BCG CI	DPT ₃ CI	OPV ₃ CI	TT ₂ 15 - 49 year pregnant
1983	5.1	7.1	3.0	2.0	2.0
1984	5.0	6.5	4.0	4.0	2.0
1985	5.8	7.8	4.0	4.0	4.0
1986	10.3	9.3	5.0	5.0	4.0
1987	11.0	15.2	10.0	10.0	7.0
1988	19.0	17.0	17.0	17.0	7.0
1988*	16.0	17.0	21.0	21.0	8.0

* These figures were quoted from the questionnaire of preliminary observation group

Source : NIHE

Table 17. Coverage Survey Results (in percentage) in Children under
One Year – March 1989

<u>Vaccine</u>	<u>Vientiane Municipality</u>	<u>Luang Prabang Province</u>	<u>Champassak Province</u>
DPT / OPV III	54	28	17
Measles	56	43	15
BCG ₁	83	82	21
TT ₂	55	38	19
Fully immunized	50	25	11

Source: WHO

Table 18. Total Number of Children Given EPI

<u>Year</u>	<u>Population</u>	<u>Third dose</u>		<u>BCG</u>	<u>Measles</u>
		<u>DPT</u>	<u>Polio</u>		
1983	334,109	3,438	2,784	16,861	5,861
1987	3,795,734	55,888	55,131	92,961	17,408

Among 96,000 of pregnant and child-bearing women, 60,000 women receive TT vaccine.

Source: WHO

coverage of EPI in March 1989 in the representative areas, Vientiane Municipality (middle of the country), Luang Prabang Province (North), and Champassak Province (South). Table 18 also indicates marked augmentation of total number from 1983 to 1987 that received EPI. In the interview with authorities of Vientiane Municipality Ministry of Health, very high coverage rates were shown to us such as DPT-3 46 %, OPV-3 (polio) 46 %, BCG 70 %, tetanus 57.6 %, and in a district OPV-3 72 %.

The EPI program will be expanded in coverage as well as target districts, but consequent fruits should be presented as improvement of mortality, morbidity and increase of serum antibodies.

5-2. International Assistance on EPI

WHO and UNICEF are delivering much assistance to Lao PDR on EPI, The budget of Lao PDR on EPI in 1988 was 664,000 US\$ among which 450,000 US\$ were given by UNICEF. Japanese government would also give assistance to EPI.

5-3. EPI Center

This is settled in NIHE and the chief scientist is Dr. Bounpheng Philavong.

5-4. Strategies of EPI

The actual work of EPI acts in coordination with MCH and PHC members, and the all strategies can be divided into 4 activities:

- a) Fixed Centres: vaccinations days are carried out at least once a day at the district level in 79 districts and every day at central and provincial hospitals. By this system, the district and commune health workers become directly involved in immunization

activities and immunization becomes one of their routine functions to be carried out regularly.

- b) Immunization weeks: will be carried out with the full participation of schools, teachers, students and other mass organizations such as Lao Women Union. The mass campaign will be held 3 times per year in the selected districts.
- c) Polio Immunizations Days: The basis for operational strategy is full involvement of the educational system, utilization of the services of schools, teachers and students. In this strategy, the students of Primary School act as Public Motivators. Secondary school children work as agents to bring eligible children of under 5 to immunization sites. The teachers act as vaccinators.
- d) Mobile Teams: the vaccinations teams from district level will visit the areas, which are considered difficult to reach. Each village is to be visited 6 times per year (once every in two months).

5-5. National and Provincial EPI Commissions:

The National and Provincial EPI commissions, which were established during the year 1989 will be the people from Ministry of Planning and Finance, Ministry of Education, Ministry of Defense, Ministry of Interior, Ministry of Transportation and Telecommunication, Ministry of Information, Lao Women Union, and Lao People's Revolutionary Youth Union.

The commissions are in charge of planning, monitoring and evaluation of the overall EPI programme.

As to the improvement of EPI programme, some problem are indicated as follows; (1) supply cars for transportation of vaccine is very much desired, and the cars should be refrigerator equipped with sun-power electricity, which is hoped to be easily repairable. (2) Many numbers of refrigerators with electricity produced by sun power.

6. WATER SUPPLY AND SANITATION

6-1. Backgrounds

The majority of the people in Lao PDR depend on water from springs, rivers, ponds or wells for washing and drinking. Much child and female labour is expended each day to fetch water for household use. The quality of the water for safe drinking from these sources is uncertain in view of the lack of preventive measures to ensure that the water is relatively free from pollution. Fortunately, the need to boil water before drinking is generally known, except some ethnic minority in the uplands do not prefer habitually to boil water for drinking.

An even greater majority of the people have no proper sanitation. Defecation is done in the open and this increases the problem of environmental and water pollution. Standard of personal and household hygiene, given that water sources are often some distance from the home, are generally not very high.

Hence death and disease caused by poor environmental sanitation and drinking of polluted water are major problems. The most prevalent diseases affecting infants and children are those in the water-related insect vector and environmental contamination categories. They include malaria and dengue fever, diarrhoeal diseases, parasitic infestations and skin, eye and other harmful infections. Improvement of community hygiene and personal hygiene through better waste-disposal facilities and greater access to safe drinking water is therefore essential in order to significantly reduce the disease incidence.

6-2. Water Supply and Sanitation Coverage.

(1) Assessment Problem

Although it is generally agreed that the coverage of water and sanitation services has to be increased, the assessment of actual needs for

planning the supply of these facilities has been difficult. In the past, there have been several attempts to estimate water supply and sanitation coverage in the country. However, these attempts were handicapped by (a) lack of clear-cut norm for defining standards of water supply and sanitation services, (b) lack of surveys and primary field data. Hence, there are conflicting estimates of water and sanitation coverage in the country.

In 1981, the UNICEF staff conducted their own estimation of the water supply sources in the country and this has formed the basis for the setting of targets for the Decade of Water Supply Plan for the country, and these estimates are shown in Table 19.

(2) Lao Water and Sanitation Plan for the Decade

Recognizing that the lack of safe water and sanitation services are fundamental impediments to improvement of the health and welfare of poor people around the world, the United Nations General Assembly declared that the 1980s should be entitled the International Drinking Water Supply and Sanitation Decade. The government of Lao PDR has expressed support for the aims of the United Nations declaration, and in general accordance with the action plan for the Decade has established a water and sanitation plan for the period 1982-1986 and a further plan for the period 1987-1990. Under this plan, 25% of the rural and 50% of the urban population (or 27% of the total population) will be provided with safe water and adequate sanitation by the end of the first period. By 1990, it is expected that 76% of the total population will be served. Table 20 shows the projected sources of drinking water available to the population by 1990. However, a comprehensive plan for the realization of these targets has not been published. In the column of Source in Table 20, there are special technical terms which are not always understandable for other medical people.

6-3. Organizational Structure and Services

Table 19. Water sources of the Lao PDR

Water Source	(Percentage of Population)	
	For Drinking	For Other Uses
River	35-40	40-50
Dug Well	25-35	30-40
Spring	30-40	20-30
Urban Piped System	3	3
Bore Hole	0.2	0.2
Rural Piped System	0.2	0.2

Source: UNICEF Field Staff's Estimates, 1981

Table 20. Estimated Sources of Drinking Water (1981 - 1990)

Source	Population In Thousand		
	1981	1986	1990
NAM PAPA (URBAN PIPED WATER)			
House Connection	100	150	200
Public Standpost	0	100	200
SPRING			
Traditional	1,800	900	0
Protected	0	500	800
Bamboo Gravity Scheme	5	200	100
Permanent Gravity Scheme	10	100	300
WELL			
Traditional	1,400	900	0
Ring-well	40	500	700
Improved Well	0	200	800
Bore Hole	5	200	1,800
RIVER			
Traditional	2,100	1,400	0
Infiltration Galleries	0	150	500

Source: UNICEF

In 1981, a National Committee for the Water Supply and Sanitation Decade was formed, comprising the Ministries of Health, Construction and Agriculture, and the State Planning committee. Whilst this committee has not remained active, its original decision on the allocation of responsibility amongst the national ministries, according to their area of technical competence, has determined developments in areas of water and sanitation services in the past five years.

The Ministry of Construction has retained its responsibility for urban piped water systems; the Minister of Agriculture was expected to provide well-drilling services and to promote domestic water supplies from irrigation projects; and the Ministry of Health was made responsible for all other rural water supply and sanitation activities. This allocation of responsibilities at the national level concerns planning, finance, training, and the mobilization of external resources. However, the physical implementation and construction of projects fall, in general, under the authority of the 17 provincial administrations and their technical departments.

(1) Minister of Construction and Urban Water Supply

The Ministry of Construction supervises the Nam Papa Company (Urban Piped Water Company) which is responsible for the operation and maintenance of the Vientiane water supply system serving approximately 100,000 people (or 27% of total population of Vientiane Municipality). It also provides services to three other provincial piped-water systems in the country which cater for operation and maintenance of existing urban facilities in Luang Prabang, Savannakhet, and Paksane. Nam Papa Vientiane is also currently providing guidelines on the planning of three proposed city water systems, namely for Thakhet, Sayaboury and Houeixal.

(2) The Ministry of Health and Rural Water Supply

The Ministry of Health has significantly increased its activities as a result of the water Decade Plan. In 1982, a Directorate of Rural Water Supply and Sanitation was created within the Ministry's Institute of Hygiene to support the increased activities. The creation of

the Directorate was assisted by a UNDP/WHO project and by UNICEF. The Directorate has three principle functions;

- 1) Planning national rural water supply and sanitation activities; receiving imported supplies and distributing them to the provinces.
- 2) Training technicians in the design and construction of water supply and sanitation installations.
- 3) Research, development and dissemination of various technologies.

(3) *The Ministry of Agriculture*

The Ministry of Agriculture has not played a major role in this sector. Drilling rigs controlled by the Ministries of Agriculture and Construction have drilled about 80 bore wells; however, these Ministries have no budgetary commitment to Rural Water Supply and Sanitation or by the Provincial Administrations.

(4) *Provincial and District Level Participation*

At the local level, the District Administration and its Health Committee, assisted by the Provincial Administration, are involved in proposing projects and implementing those sanctioned. In general, this is the level of government which interacts with the community, providing public health services and education. Most projects rely heavily on community participation to provide free labour and local materials. The need for these contributions ensures that the beneficiaries are involved from the inception of the project.

6-4. *Target and Achievements*

The Plan of Operations agreed in 1982 between the government and UNICEF called for the construction of 4,715 new or improved water sources benefiting some 703,000 people. Recognizing the acute shortages of resources, particularly of finance and trained man power, the major emphasis of these plans was to construct simple, low-cost water sources. By mid-1986, the total units completed totaled only 1,455 (Table 21). It is now evident that the planned targets for the provision of various types of water supply sources were overoptimistic.

Government interest has been greatest in the more complex and costly types of water systems (piped systems, hand pumps and dug wells). Correspondingly, there has been fair progress made in the number of such water systems installed and the building up of local capacity and skills for their installation. However, further experience and training are required by local level technicians to ensure that adequate technical construction standards are adhered to and that appropriate maintenance provisions are made.

More disappointing has been the progress on the very simple and low-cost water schemes planned, which, given the country's limited resources and immense water needs, should have been more suitable and feasible. This shortcome has to be attributed to the failure of government and international agencies involved (Ministry of Health, UNICEF, WHO) to put adequate priority on the introduction and dissemination of these techniques. Other reasons are the preference at all levels of government for "modern" and complex systems. It also appears that priority has been given to the convenience of bringing water to "dry" villages, in preference to reducing health problems caused by polluted local water sources.

6-5. Constraints in Supply of Water and Sanitation Services.

(1) Limited Resources and Competing Priorities

A constraint in the expansion of rural water supply and sanitation is the shortage of foreign exchange. The government has committed little of its own meagre resources, and not much international assistance has been forthcoming. The government/UNICEF plan has been curtailed because donors for 8% of the programme have not yet been found, and a contribution from other agencies for 47% was not committed until late 1985.

In some regions, the limited resources available for low-cost systems benefiting large populations have been diverted to provide

Table 21. 1982 – 1986 Water Supply Scheme - Targets and Achievements
(Number of Units)

Type of Scheme	1982 – 1986	
	Planned Target	Achievement
Spring protection	1,160	0
Bamboo piped gravity scheme	235	0
Plastic piped gravity scheme	80	52
ring wells	1,650	812
Improved wells	60	252
Infiltration galleries	480	0
Repaired bore wells	150	248
Urban standposts	500	5
TOTAL	4,715	1,455

Source: Lao PDR Government Statistics Source: UNICEF

higher-cost systems for government institutions or other priority locations. This situation is exemplified by the Nam Papa piped system serving parts of Vientiane city.

The Nam Papa system operates effectively, but it is also very costly. An Asian Development Bank loan of US\$ 5 million assisted the expansion of the Vientiane system in 1978-82. The Nam Papa Company charges consumers for water connections and supply, but the level of these charges has prevented 40% of the population within the piped area of Vientiane from utilizing the service. For the operation and maintenance of the system, which benefits an estimated 100,000 people (or less than 3% of the country's population). The Nam Papa Company employed some 300 workers.

The level of public financial and manpower resources expended on the Vientiane Nam Papa system thus exceeds public commitments to all other water supply and sanitation activities in the country.

(2) Lack of Coordination and Communication

In this programme, the central government also makes the plan, while the provincial administration has obligation to implement the plan. There sometimes occurred inadequate communications between them.

(3) Shortage of Technical Staff.

In particular the Directorate in Vientiane is severely understaffed. The senior positions are occupied by medical doctors who are also responsible for the management of other departments. There is also an acute shortage of experienced Lao engineers and technical staff. This manpower shortage stems partly from the national shortage of trained personnel, but more importantly from the financial constraints which have been most severely felt in the Ministry of Health. At the provincial levels, the shortage is more acute. Although there has been a rapid increase in construction work in the last few years, local departments have few staff with a technical background. This shortage

is worsened by the fact that the local departments have low priority in the allocation of government-trained technical personnel.

(4) Problem in Training

To date four training courses conducted at the Directorate have trained some 200 technicians. The aim is to have at least 2 technicians posted in each district. Of the 155 technicians trained up to the end of 1985, 131 are active in the field. According to the evaluation of the WHO/UNDP project, the weakness of the training programme is that the basic level of education of many of the trainees is not adequate and that no proper assessment had been made, either during or after the training, to assess the level of understanding or motivation of the trainees.

Also, insufficient effort has been made by the Directorate to follow-up on the technician who have passed through the training programme, and therefore little information was available about their performance in the field, their understanding of what had been taught in the light of their subsequent experience, or their views on improving the course. Better follow-up would have been beneficial in providing support and encouragement to the technicians and improving future courses.

The original training plan had called for the creation of several levels of technicians. Grade A technician could be trained in 3 months to be capable of supervising the construction of simple low-cost projects such as ring-wells, spring protection and infiltration galleries. For more complex techniques, such as gravity piped systems, the more competent Grade A technicians could be upgraded to Grade B with a further training course. In practice, this distinction has been omitted and the present two and a half month course includes both Grade A and B curricula. This is found to be too rapid for many trainees.

6-6. Program for Sanitary Waste Disposal

A latrine program was started in 1977 with the importation by UNICEF of 1,000 Malaysian plastic latrine pans. Encouraged by government's expressed commitment for environmental hygiene, a further 55,000 pans were imported in the next two years. These were distributed to all provinces. Although pilot installations were made for demonstrations in many communities, the program was not successful and most of the pans can no longer be traced.

Several technical features of the latrine pans have been cited as contributing to this failure. The quantity of water required for flushing was excessive for many locations. The local practice of using sticks for post-faecal ablution caused difficulties for disposal through the pan. There were also many pans installed without adequate foundations or over unstable pits, leading to collapse or failure.

There have also been suggestions that there is inadequate comprehension of the importance of sanitary excreta disposal. It is felt that the interaction of water/sanitation/health education does not appear to be clearly understood and supported at all levels. The understanding by each community is only partial: the benefits derived from one of several wells located right in the middle of the village in terms of decreasing the workload of women and children are clearly appreciated, but the health aspects of safe drinking water and proper waste disposal is seldom clearly understood by the villagers. The problem is lack of any serious health education, in the absence of which there is no felt need at the community level for environmental sanitation.

However, there are many instances where the plastic pans and other types of pit latrine have been successfully installed, and there are communities where extension work has succeeded in the general adoption of latrines. Ministry of Health still has a strong commitment to environmental sanitation and wishes to continue sanitation activities, but it has been chastened by its past experiences and is not tready to make long term plans. It would therefore be worthwhile to study the successful cases, and to determine the physical, social, technical and institutional factors which may have led to these

achievements. The results of such an evaluation would be most valuable in planning future programmes in the area of sanitation services.

6-7. International Assistance

The major contribution from WHO has been the UNDP-financed project to support the Directorate of rural Drinking Water and Sanitation. The project provides an expert, a volunteer, training grants, equipment and other technical assistance, estimated to cost more than US \$750,000 for the period 1982-86.

UNICES's assistance amounted to US\$1.25 million, of which more than US\$1 million was spent on construction materials. The balance was applied to the supply of tools, equipment, training and other support activities. In terms of technical expertise, UNICEF currently provides one project officer and three UN volunteers to the programme, two of whom are out-posted to Luang Prabang and Pakse.

Several other donors, including UNHCR, Quaker Service and the Mennonite Central committee, have also provided small amounts for water and sanitation services in specific locations.

6-8. Program in 1987-1989

According to the UN's Declaration on Water Supply and Sanitation, WHO, UNDP and UNICEF are continuing the assistance. The projects would improve more with the coordination of Lao PDR authority. In the rural region, work is implemented by participation of communities. The centres of this project are established in Champassack and Savanakheth, and the maintenance and repairing of hand pump wells are planned. This project contains dispatching of trainees to Bangladesh, India, Thailand and Malaysia, and total of foreign assistance amounts to 52,500 US\$.

7. FOOD AND NUTRITION

7-1. Current Nutritional Situation

(1) Child Malnutrition

Institutionalized nutritional surveys do not exist in the Lao PDR. Therefore concrete data on the actual nutritional situation and the type of nutritional deficiencies found among children and women are distinctly lacking. To date only two nutritional surveys have been conducted. The first was done by Ireson in 1969 and covered six villages in the provinces of Vientiane, Sayaboury, Savannakhet and Sekon. The other, completed by Kripps in 1984, was based on a sample of 6,612 children 0-5 years old from urban Vientiane and the rural areas of Vientiane Province, Luang Prabang, Savannakhet, Champassak and Khammouane.

These are the only studies available to provide some information on the incidence of child and maternal malnutrition in the country. However, it should also be noted that the two surveys only covered the lowland Lao population and present no information on the upland ethnic minority groups. Hence, the data cannot be generalized for the entire country and care should be taken when interpreting the information on the nutritional situation of children and women discussed below.

Kripps' 1984 study, being the more recent of the two studies, is probably more relevant in describing the nutritional profile of children in recent years. However, as food practices and food beliefs among the Lao have not changed, the information in the Ireson study is also very useful.

Kripps' study shows that severe malnutrition among young children is uncommon. However, significant low weight and height for age are found in three very remote villages, all of which are characterized by relative isolation and comparatively poor access to

reliable water supply. This implies that the problem of severe malnutrition in Lao PDR may be confined to highly isolated rural locations.

While severe malnutrition is not widespread, moderate malnutrition affects 35-40 % of the total child population as shown in Table 22. No significant differences were observed between males and females. The ranking of provinces with respect to malnutrition with weight-for-age as indicator, shows the following; Khammouane (50%), Champassak (46%), Savanakheth (40%), Luang Prabang (31%), Vientiane (30%) and urban Vientiane reaches (30%). This shows that while malnutrition is a rural and urban problem, it may be significantly more prevalent among children in the rural areas.

As breast feeding is prevalent among Lao mothers (93% of mothers breastfeed) for at least one year, malnutrition among children generally sets in only after the age of six months. Kripps noted that children most seriously affected by malnutrition were those aged 1-3 years. This cause is directly related to the poor quality of the children's diet and infant feeding practices.

(2) Maternal Malnutrition

Although the study did not include any quantitative analysis of the nutritional status of the mothers, Kripps observed that maternal nutritional status among the survey population was not good. The situation probably deteriorates with each successive pregnancy due to the Lao practice of post-partum food taboos.

Anemia among pregnant women is also suspected to be high but there is not recent statistical information to indicate the scale of the problem. Based on Ireson's 1969 study, it was noted that the average haemoglobin count for pregnant women visiting Vang Vieng Hospital in the 1960s was 11.2; that is 10-30 % below the normal average. As there is not reason to suspect that the problem of anemia has improved, this finding is suggestive of the general situation of pregnant women today.

Table 22. Percent Undernourished according to Weight for Age by Province

Province	Number	Percent of Sample > -2SD	Weight-for-Age* < -2SD
Vientiane City	2,457	70	30
Vientiane Province	1,383	70	30
Luang Prabang	626	69	31
Savannakhet	493	60	40
Champassak	1,112	54	46
Khammouane	541	50	50
TOTAL	6,612	65	35

* Median = -2 Standard Deviations (SD)

Source: UNICEF

(3) Nutritional Deficiencies

In terms of specific nutritional deficiency, the information is very scanty. The 1984 survey noted that goitre is particularly prevalent in the mountainous regions.

The Ireson study also noted that Lao diet was especially deficient in vitamin A, and vitamin B₂, and moderately deficient in vitamin B and C. Vitamin A and C deficiencies were attributed to the low average consumption of vegetables and fruit. The chief source for vitamin B₁ and B₂ in the Lao diet comes from rice; however, according to Ireson, the habit of eating polished rice, together with the practice of pre-soaking the rice before steaming robs it of much vitamin B. As is well-known, vitamin A deficiency affects growth. It is suspected that similar problems also prevail among children today.

7-2. Causes of Malnutrition and Nutritional Deficiencies

Nutritional status is linked to food availability and also to culture-related food beliefs and food practices both at the macro-level and at the household level. At the macro-level, food availability is determined to a large extent by the economic status of the household. Poor families are less likely, than more well-to-do ones, to be able to provide sufficient food in terms of both quantity and variety to meet the nutritional needs of their members.

(1) Food Availability

In the case of the Lao PDR, food shortage at the national level was a serious problem in the years immediately following end of the war in 1975. Political instability, inclement weather and the sudden termination of assistance from the United States led to serious disruption in food production and food distribution. At that time malnutrition was asserted to be quite serious among fairly large segments of the population, especially among children.

However, in recent year, due to government efforts in boosting food production, rice self-sufficiency has been achieved at the national level since 1984. Hence in terms of basic food availability, the problem is not such a serious one in the country at the present time.

This is confirmed by Kripps' finding which asserts that food scarcity is rarely the underlying cause for malnutrition among the studies population. Ireson's earlier study also came to the same conclusion, indicating that historically, food availability is not a major problem.

This is understandable, given that more than 80% of the population are engaged in subsistence farming supplemented by hunting and gathering. As land scarcity is hardly a problem in the Lao PDR, it can be assumed that under normal circumstances families can produce enough food to meet their own consumption requirements.

In 1985, paddy production amounted to 1.4 million tons for a total population of 3.6 million people, equating to a per capita rice-derived energy intake of more than 2,500 kilocalories. Those who do not farm, like government employees and their dependents are given, in addition to a minimal salary, a monthly rice allotment of 20 kg per adult, and 10-15 kg per child depending on age. When supplies are regular, this equates to a daily rice-derived per adult calorie intake of 2,700 kilocalories, which is about 90% of the daily recommended allowance for an adult male.

The Laotian basic rice diet is usually supplemented by varying quantities of fish, fish sauce, frogs, insects and vegetables, much of which can be collected or grown even by city dwellers. Meat, which is expensive, is seldom consumed on a regular basis, except among the more affluent.

Thus, under normal circumstances, the Lao diet, though by no means lavish or varied, may be considered sound from a nutritional point of view.

Table 23. Estimated Rice Surpluses and Deficits by Province, 1984

Province	Population ^a (‘000 persons)	Rice production ^b (‘000 tons)	Per capita production (kg)	Surplus (+) or Deficit (-) ^c	
				(‘000 tons)	(kg/capita)
Phongsaly	120	21.1	176	+0.5	-4
Luang Nam Tha	95	19.8	208	+2.7	+28
Bokeo	54	10.5	194	+0.8	+14
Oudomxay	183	38.6	211	+5.7	+31
Luang Prabang	289	53.8	186	+1.7	+6
Sayaboury	219	42.6	194	+3.1	+14
Houaphanh	205	47.5	232	+10.7	+52
Xiang Khoang	158	35.2	223	+6.8	+43
Vientiane	259	71.8	277	+25.1	+97
Vientiane Pref.	369	58.7	159	-7.7	-21
Borikhamay	120	28.4	237	+6.8	+57
Khammouane	209	51.2	245	+13.6	+65
Savannakhet	532	112.9	212	+17.0	+32
Saravane	184	50.6	275	+17.0	+95
Sekong	50	6.2	124	-2.8	-56
Champassak	293	127.2	323	+56.3	+143
Atapeu	68	15.8	232	+3.5	+52
TOTAL	3,508	792.6	226	+161.4	+46

- a. March 1985 census data adjusted to mid-1984 using the estimated current growth rate, 2.9%.
- b. Paddy production estimates converted to rice equivalent assuming a 60% milling rate.
- c. Relative to the Government's standard of 180 kg of rice per capita (300 kg of paddy).

Source: World Bank, 1986

(2) Regional Variations and Seasonal Shortages

Although the macro-level food situation is generally satisfactory, it masks much of the regional and household level variations. For one, rice sufficiency has not meant that rice is adequate everywhere. Uneven production, poor transportation, and climatic vagaries have meant that certain segments of the populated isolated communities do not have adequate access to rice. This is suspected to be true of certain ethnic minority communities in the mountain provinces of Sekong, Phongsaly, Luang Prabang and Bokeo. These provinces are either rice-deficit areas or have only very marginal surplus as shown in Table 23. For some communities in these provinces, food shortage may be a problem, if not all year round, then at least during certain months of the year.

Food availability, both in terms of quantity and variety, is also very seasonal. Much of what is normally consumed in an average Lao farming family, aside from rice, is usually foraged from nearby rivers and forests. Thus, as Ireson's study shows, the food intake of the families varies quite substantially from season to season. Although calorie intake is fairly uniform throughout the year, Ireson found that protein consumption among villages dropped quite substantially during the rainy season. Similarly calcium and iron intake were highest during the cold season and lowest during the hot season. Apart from availability, these variations are obviously linked to the agricultural cycle. The rainy season is also the rice planting season, which means that all hands are required to work in the fields and hunting and gathering activities often come to a standstill.

These seasonal variations in food consumption patterns are perhaps more important for the analysis and understanding of child and maternal malnutrition than overall food availability. This is especially so in view of the fact that the pattern of disease occurrence, especially diarrhoea and malaria also tends to be cyclical in nature. It has been noted, for example, that diarrhoea and malaria are especially rampant at the beginning of the rainy season. This is because the danger of pollution of drinking water from surface run-off and the accumulation

of stagnant water is greatest during this period. As this is also the period when men and women are most busy in the fields and the daily food needs and hygiene of children and infants most neglected, this will be the season when they are most likely to be poorly nourished and most susceptible to disease and sickness.

Poverty exacerbates the situation. Most families, whether rural or urban, are poor and have little or no savings to tide them over difficult periods. In the rural areas, food is especially short just before the harvest when last year's rice stocks are almost depleted and this year's crop has not been gathered. This shortage can trigger the onset of malnutrition among children and initiate a cycle of sickness and ill health.

Seasonal and overall food shortages are suspected to be even more serious among the upland minority ethnic groups who depend on slash and burn cultivation. As a result of environmental deterioration, the returns from this form of cultivation have become progressively less economical over the years. This could mean that the nutritional status among the upland ethnic minority groups is likely to be much worse than the lowland groups.

(3) Feeding Practices

Cultural beliefs about food and feeding practices are just as important, if not more so, than food availability in affecting malnutrition. The nutritional survey of 1984, in fact, attributed the primary determinant of malnutrition in the areas surveyed to child feeding practices. Although 93% of mothers reported breastfeeding their children for a minimum of one year, initiation of breastfeeding is often delayed in the rural area for 1-3 days to await the appearance of milk. Laos mothers are not aware of the value of colostrum. During this period, only boiled water is given to the infant. Such a practice deprives the infant of nourishment, denies the benefit of colostrum-transmitted immunological factors, and, ironically because of delayed suckling, retards the onset of milk production.

The Lao believe that rice will make children grow up stong. Infants are therefore introduced to a rice diet very early. Among Kripps survey population, 40% of the mothers said that they began feeding rice to their infants by age 4 weeks. By contrast infants are not introduced to a mixed diet until very late. Fifty-six percent of the mothers had not introduced their infants to a mixed diet by age 12 months. These feeding patterns, as Kripps stated, are in contrast to the recommended infant feeding practice of breastfeeding until at least age 1 year.

Early introduction of rice impedes breast-milk consumption by physically reducing available stomach volume, thus reducing protein, vitamin and mineral intake and initiating growth retardation. Furthermore, the late introduction of a mixed diet deprives the growing infant of adequate nutrients from food sources other than breast-milk and rice. The phenomenon of late introduction of a mixed diet to infants appears to be associated with the Lao preference of eating glutinous rice. Glutinous rice cannot be cooked into a gruel in which supplementary foods like fish, meat and vegetables can be incorporated for infant feeding. These solid foods are given only when infants are old enough to chew. Ireson's study also supports Kripps' finding of late introduction of mixed feeding. Her survey results show that on average infants are only given meat at 9.5 months, eggs at 10.5 months, fruit at 11.5 months, fish at 12 months and vegetables at 15.5 months.

Hence it was observed that the proportion of malnourished children increase with age through the first year as 24 measured by weight-for-age and height-for-age (Table 24 and 25).

(4) Maternal Diet

Cultural beliefs regarding what constitutes suitable or unsuitable food also determines the post-partum diet of women. The post-partum diet is nutritionally very poor. It is generally characterized by a rice-salt-water regimen for 2-3 weeks after delivery, because of food taboos on the consumption of most fruits, vegetables and meats by nursing mothers. Seventy-five percent of the mothers in Kripps' sample

Table 24. Total Undernourished according to Weight for Age

Age Group (months)	Number	Percent Sample (Weight-for-Age *)	
		> -2SD	< -2SD
0-5	755	95	5
6-11	696	76	24
12-23	1,116	51	49
24-35	986	57	43
36-47	1,214	58	42
48-60	1,845	66	34
TOTAL	6,612	65	35

* Median = -2 Standard Deviations (SD)

Source: UNICEF

Table 25. Total Undernourished according to Height-for-Age

Age Group (months)	Number	Percent Sample > -2SD	(Height-for-Age *) < -2SD
0-5	426	86	14
6-11	555	75	25
12-23	1,042	57	43
24-35	975	58	42
36-47	1,212	54	46
48-60	1,845	56	44
TOTAL	6,055	60	40

* Median = -2 SD

Source: UNICEF

reported that they did not return to a normal diet until 4 weeks after delivery.

These practices are very detrimental to the nutritional status of the nursing mothers. It has been estimated that to make up for demands of lactation, nursing mothers need a minimum of an additional 500 kilocalories per day. Even without post-partum food denials, this shortfall is not likely to be made up in the ordinary diet for mothers. These factors, coupled with the generally observed short birth intervals, inevitably lead to a deterioration of the mother's health status with each successive pregnancy. Ultimately, the probability of subsequent children becoming malnourished and succumbing to disease is progressively increased.

7-3. Organization Structure and Services

There is a national food and nutrition plan in the Lao PDR, other than the goal of rice self-sufficiency. Specific food and nutrition objectives do not form part of long-term multisectional approaches outlined in either the last or the next Five-Year Development Plans.

The Ministries of Health and Agriculture are the most relevant government organizations for combating malnutrition. In addition, mass-based organizations like the Lao Women's Union can be an effective channel for nutritional education and other inputs towards improving child nutrition.

The members of Japan Volunteer Centre JVC have observed the food and nutrition status in rural areas similar to those mentioned above, and reported the situations in detail. They have participated in also education of life-improvement women who have been selected from a respective province by activity of the Lao Women's Union.

(1) Nutrition and Health Services

At present, nutrition is an integral part of the Maternal and Child Health Services of the Ministry of Health. However, the lack of policy

guidance, lack of awareness among health workers of the relationship between nutrition and health and lack of training in this particular area, is relatively the weak component of the MCH package.

In some of the more established MCH clinics, however, the component is being progressively strengthened. Monitoring of child growth and development is being carried out through the use of the "Road to Health Chart" and its use is reported to be quite satisfactory in some of the MCH clinics in Vientiane Municipality and Vientiane Province.

It is also the opinion of the nurse-tutor of Save the Children Fund that nutritional surveillance using the Road to Health Chart to identify "at risk" children is now possible in some of the more established MCH clinics. She has suggested that an "at risk" register be set up for:

- i) children whose birth-weight is below 2.5kg,
- ii) children whose weight is found to be below the third percentile.

She also suggests that initially this should be tried out in only a small number of clinics to see how feasible the system would be for following up on these children and whether mothers and nurses would in fact act on the information provided.

Recently, some attempt has been made to introduce nutritional education in some of the larger MCH clinics in the Vientiane Municipality. This consists largely of demonstration of weaning foods such as soybean milk and rice soups, also using color-posters showing the method. Feedback suggests that these sessions are very popular with the mothers. However, a lack of travel resources and funds has largely prohibited similar types of outreach work, especially in the smaller clinics in the rural communes. It is suggested that some system of revolving funds should be set up to allow for such demonstrations to be carried out on a regular basis.

Concerning weaning-food, it was originally conceived that part of this educational material would be from the products of the Weaning Food Factory at Tha Ngone, which was expected to produce an annual 7,000-9,000 kg of supplementary weaning-foods for preschoolers. However, the project is fraught with serious production problems. Apart from technical snags, the major difficulty is the regular supply of soybeans.

(2) Nutrition and School Curriculum

As for the role of the Ministry of Education, its effective contribution in this area is extremely limited. The school curriculum contains very little on food and nutrition. Inclusion of the subject would be highly desirable for it would be one way of providing this generation of students with some skills/knowledge on child nutrition, and a means to cut the cycle of ignorance and malnutrition. This lost opportunity is especially serious in view of the fact that the primary school drop-out rate is very high, particularly among girls, who in a few years will marry and produce children.

(3) Nutrition and Women's Organizations

Because of the fact that there is a department within the Lao Women's Union to promote the welfare of women and children, it has to contribute to the combating of child and maternal malnutrition in any meaningful way. At present, the union is engaged in the education of life-improvement women who belong to the union and come from respective provinces, being selected. This activity is helped by JVC women as stated above. Since the organization is composed of more than 300,000 members (8.5% of the total population) down from the central to the village level, the system has the capability to rapidly and effectively penetrate nearly all families in every village regarding nutritional education. It is with great hope that efforts and perseverance of this programme will be strengthened and bear successful results.

8. WOMEN'S PROBLEM

As with many women elsewhere in the Third World Countries, the greatest problem Lao women face today, low level of education, stress, ill health, poor nutrition and relatively inferior status in relation to men. And like elsewhere, women who are poor, ignorant, overworked, in bad health and powerless, also beget and raise children who are inadequately fed, improperly cleaned, often ill and who frequently die in infancy or early childhood. In view of well-being, it stands to reason that empowering women and improving their conditions in the home and in society is ultimately in the best interests of children. It is also ultimately in the interest of men and of society as a whole.

8-1. Current Situation

(1) Imbalanced Sex Ratio

According to the 1985 population census, there are 1,845 million females in the Lao PDR comprising roughly 51% of the total population. Thus the ratio is slightly in favour of females. The sex ratios (number of males per 100 females) are especially imbalanced in the able-bodied age groups (15-44 old-age), where there is a definite deficit of males to females, as shown in Table 26. This pattern departs from that of more stable populations and is probably due to the war in the past and more recent sex-selective migration. With the deficit of able-bodied men, the work burden on women is especially heavy. The uneven sex ratio is more noticeable in some provinces than in others. Except for Vientiane Municipality and Vientiane Provinces where men outnumber women (sex ratios of 104.8 and 100.7), women outnumber men in all the other provinces. The ratio are most imbalanced for Saravane, Atapeu, Luang Nam Tha, Bokeo, Khammouane and Sekong (sex ratio ranging from 88.9 to 93.9). Many of these are upland provinces with large minority populations whose demographic structure and composition were most affected by past political events.

Table 26. Sex Ratios for Selected Age Groups (1985)

Age group	Male	Female	Sex Ratio
15-24	288,010	338,660	85.0
25-34	227,330	249,566	91.1
35-44	153,978	162,308	94.9
45-54	120,644	131,619	91.7

Source: UNICEF

As these are areas where slash-and burn cultivation is practised, the absence of men will affect the distribution of work in the village even more seriously than in lowland provinces. Traditionally, much of the land clearing (cutting down of trees, hauling and burying) is done by men.

The women do most of the planting, weeding, and harvesting. With the imbalanced sex ratio in these areas, women and (also children), in addition to their usual chores, will have to take on the arduous tasks formerly done by men.

(2) High Fertility

Of the total female population, about 45.1% are in the childbearing age group (14-49 old-age). As the age of marriage is low and marriage is almost universal in Lao society, it can be assumed that the majority of these women are also wives and mothers.

Age specific fertility data for women is not available. Some estimates of their fertility can only be guessed at. Based on the FAO study on "Women in Food Production", Maroczy found that the average parity of women in Vientiane Provinces was 5.1 children, Champassak, 6.0 and Luang Prabang, 7.0. These figures could be under-estimated due to under-reporting of still-born or dead children. Women in the 25-44 age group, who for the most part have not completed child-bearing, had borne 4.4 children in Vientiane, 3.6 in Luang Prabang, and 4.1 in Champassak.

Kripps' 1984 nutrition survey, which had fertility data of 1,633 mothers from Vientiane, Luang Prabang, Savannakhet, Champassak and Khammouane, showed even higher average numbers of children borne. His sample of mothers in the 45-64 age group (those who have completed child-bearing) average 8.6 children per woman. On average, mothers in the age group 30-34 have already bore 4.5 children.

Although these figures are based on small samples of women and may not be representative of the fertility situation for the whole

country, they are, if anything, probably conservative estimates of the prevailing fertility behaviour among women. These figures are therefore indicative of the very high parities and short birth intervals prevalent among Lao women. The current pre-natalist population policy and the unavailability of contraceptives will ensure that this situation persists.

Frequent pregnancies, short birth intervals, poor maternal diet, and heavy workloads lead to the deterioration of women's health. An illustration of their poor health and undernourished condition is the fact that there is a fairly high proportion of low-birth-weight babies (less than 2.5 kg)--estimated at 18% of all live births. With each subsequent birth, the problem of iron deficiency anaemia and other nutritional deficiencies increases.

(3) Female Literacy and Educations

As has been shown in the section on education, women are still at a disadvantage in literacy and education attainment with respect to men. More adult women are illiterate than men, and almost all those over 45 are unable to read and write. A total of sample from Vientiane, Luang Prabang and Champassak, 21.3% of male over 35 are literate, as against only 6.1% of the females.

This situation is improving with younger women as a result of the expansion of the education system. With education now open to all regardless of sex, there are many more girls enrolled in schools today than ever before. The proportion of female students enrolled at all levels of education has improved markedly since 1975. There is near parity in primary school enrollment between boys and girls (42% girls and 58% boys), but the disparity gets greater the higher the level, indicating that girls are more likely than boys to drop out of school after a few years of education. In the upper secondary level, for example, boys comprised 62% of total enrollment in 1985. However, if the trend of female enrollment continues to improve, this will be one of the most hopeful signs for women in the future. As education is one way to cut the vicious circle of ignorance, poverty and ill health, female access to

education is a means to bring about better maternal well-being and child development.

8-2. Women's Status

(1) Women's Social Role

There are very few recent studies to give a clear understanding of the exact position of women in Lao society.

The small number of anthropological studies written in the 1950s and 1960s seem to indicate that Lao women, as in the tradition of most Southeast Asian societies, enjoy a slightly more egalitarian status than women in South or East Asia. There is no overt discrimination against females, no evidence of female infanticide or predominant son preference, and Lao women often have similar inheritance rights as men. This is largely because, especially among the lowland Lao, the practice of matrilineal residence, whereby a newly married couple generally resides with the girl's parents, is still widely practised. Land is therefore often passed down through the females.

However, as in most Asian societies, sex role differentiation between men and women is very clear and Lao women are trained from early childhood to accept a subordinate position in relation to men at home and in society at large. Female docility is viewed as a virtue and assertiveness is definitely discouraged. Although it is government policy to institutionalize greater equality between men and women, in reality there has been little substantial change in the attitudes and social roles of men and women.

(2) Women's Economic Role

Labour statistics, as with other types of statistic, are sketchy and incomplete, but based on available data provided by the Lao Women's union, women's participation in employment is quite high by Asian standards. Women make up about half the active workforce 15-44 year (Table 27). Female participation in agriculture is especially high,

comprising more than 60% of the agricultural workforce. In the industrial sector, women's participation rate is lower. Among factory workers, only 20.3% are women, indicating that perhaps there are barriers to their access to urban industrial employment. Women are fairly well represented in the civil service, but when it comes to leadership positions, they are under-represented. Table 27 shows the distribution of women functionaries at different levels in some Lao Ministries. women are underrepresent at all levels in these ministries, but particularly at the director/managerial and upper levles. Only in the Ministry of Health and Education are women slightly more in evidence, and then only from the middel level down.

Table 27. Percentage of Women Functionaries in Various Ministries by Level (1982)

Level	Ministry of Agriculture		Ministry of Health		Ministry of Education		Ministry of Industry		Ministry of Public					
	Total	Female %	Total	Female %	Total	Female %	Total	Female %	Total	Female %				
Director/Managerial	36	8.0	13	1	7.7	n.a.	n.a.	41	4	9.8	n.a.	n.a.		
Upper	299	1.7	244	73	29.9	1,036	242	153	9	5.9	75	2	2.7	
Middle	806	171	21.2	962	380	39.5	3,168	1,247	240	21	8.8	530	27	5.1
Lower	2,460	335	13.6	9,340	4,942	52.9	16,130	5,254	637	254	39.9	1,111	172	15.5

Source: Lao Women's Union, UNICEF

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