Chapter 3 PUBLIC HEALTH DEVELOPMENT

3.1 Existing Conditions of Public Health in Thailand

3.1.1 Health Status

(1) Basic Health Indicators

Thailand is in a period of epidemiological transition. While poverty-related diseases such as infectious diseases and malnutrition have dramatically decreased, injuries and non-communicable diseases have been increasing. Due to rapid economic growth during the past decades, a rise in income levels and changes in life-style have had a great impact on changing disease pattern. Three leading causes of death in Thailand are (i) heart diseases, (ii) accident and poisoning, and (iii) cancer. As Thailand moves toward more rapid industrialization, chronic diseases and accidents are likely to become more prevalent.

Table 2.3.1 shows the major health indicators in Thailand. Statistics such as life expectancy, infant mortality rate (IMR), crude birth rate, and maternal mortality rate indicate improvement in public health in the last decades. Achievements in population policy have resulted in an increase in the elderly population and a decrease in the labor force. At the same time, changes in social values such as consumption behavior, working competition, and transition from an extended family to a nuclear family, have caused social problems related to mental health, drugs, and crime. Accidents, suicide, murder, drug addiction, mental health disorders, occupational health, and HIV／AIDS will be high-priority health problems in the near future.

Comparison of Health Status and Financing in Asian Countries (1992)

	GNP per capita ($)	Per cent of Govt. Health Budget	Infant Mortality Rate	Life Expectancy	Population per Hospital Beds
Malaysia	2,790	6.8	14	71	435
Thailand	1,840	5.7	26	69	738
Philippine	770	3.3	40	65	647
Sri Lanka	540	4.5	18	72	368
China	470	4.2	31	69	465

Although health indicators have improved rapidly in Thailand, the rates indicated in the above table are still worse than those of other Asian developing countries. Countries such as Sri Lanka and the People's Republic of China have devoted less budget to the health sector but have better health status than Thailand.

(2) HIV/AIDS

Thailand has the largest number of reported AIDS patients in Southeast Asia as the following table indicates. AIDS was first reported in Thailand in 1984 in homosexual males. Since then, a total of 36,629 cases has been reported (by the end of March 1996). Estimated HIV infections in Thailand were 700,000 in 1995 according to official data, and will be 1.3 million by 2000 and 2.2 million by 2010 according to a projection by NESDB.

AIDS and HIV Infections in Southeast Asian Countries (as of Dec. 1995)

Country	Reported AIDS Cases	Estimated HIV Infections
Thailand	29,090	700,000
India	2,095	1,500,000
Myanmar	570	400,000
Vietnam	233	200,000
Philippines	220	19,000
Singapore	145	1,000

The predominant modes of HIV transmission in the late 1980s were homosexuality and intravenous drug use. Today, it is clear that HIV has spread rapidly from the original high-risk population into the general population. In 1995, 42.6 per cent of total AIDS patients were general workers, including factory and construction workers. A dramatic increase of HIV infections among housewives and girlfriends of men who visit commercial sex workers is a major focus of concern. Its growing magnitude is tragically reflected by the fact that 2.2 per cent of pregnant women attending ante-natal care clinics in June 1995 tested HIV positive. The number of AIDS widows and the number of vertical HIV transmissions from mothers to their infants have been increasing. Also, abandonment of orphans related to HIV/AIDS is a critical social problem.

In 1991 the Thai government launched a national AIDS campaign through all kinds of media. A national survey in 1995 showed that around 80 per cent of the adult population know about AIDS, its transmission, and how to prevent HIV. However, there is still a wide gap between knowledge of risk and the practice of safer sexual behavior.

3.1.2 Health Resources

(1) Health Services

The health service system in Thailand can be simply categorized into three types: (i) the Government sector, which includes the Ministry of Public Health (MOPH) and other governmental agencies, (ii) non-governmental organizations, and (iii) the private sector. Public hospitals accounted for 76.7 per cent of the total number of beds and 67.3 per cent of the total number of hospitals in 1993.

Referral System of MOPH Hospitals in Thailand (1994)

Types of hospital	No. of hospitals	No. of beds	No. of doctors	Population Coverage
Regional Hospital	17	500 to 1000	-	300,000 to 1,000,000
Provincial Hospital	75	150 to 500	-	300,000 to 1,000,000
Community Hospital	706	10 to 120	1 to 11	50,000 to 100,000
Health Center	8,699	0 to 3	none (nurse, midwife, junior sanitation)	5,000 to 10,000

In the public sector, the MOPH hospitals provide services through a three-tiered health delivery system as indicated above. In each of the 7,159 tambons (subdistricts), there is at least one health center which is staffed by a technical nurse, midwife, and junior sanitation. They provide primary care such as emergency treatment, immunization, essential drugs, delivery, and dental health. They also support community development and the Primary Health Care program, which is operated by village health volunteers, village committees, and housewife groups in each village. In 1994, 572,172 people served as health volunteers. There are several Village Funds such as Revolving Drug Funds, Sanitation Funds, Nutrition Funds, and Health Card Funds that are managed at the village level.

Almost 92 per cent of the nation's districts have a community hospital that is responsible for providing comprehensive curative care, health promotion, prevention and rehabilitation. Most of the provincial hospitals, located in each province, have specialists and are fully equipped; also all kinds of medical personnel are available. Complicated and severe cases are generally referred to the regional hospital or university hospital in each region, but are often referred to large special hospitals in Bangkok or private hospitals in the region at the request of patients.

As for the private sector, the number of private hospital beds and clinics has nearly doubled during the past decades. Increasing demand for high quality medical services has stimulated the growth of private hospitals in proportion to increases in income level. Private hospitals and clinics are concentrated in urban areas, especially in the BMA.

Distribution of Health Resources in Thailand (1991)

Region	No of physicians	per cent of total	No of hospital beds	per cent of total
Bangkok	5,832	45.6	18,804	23.8
Vicinity of Bangkok	609	4.8	3,154	4.0
Central	421	3.3	4,916	6.2
Eastern	682	5.3	6,252	7.9
Western	515	4.0	5,470	6.9
Northeastern	1,818	14.2	15,668	19.8
Northern	1,747	13.6	14,787	18.7
Southern	1,179	9.2	10,105	12.8

(2) Health Manpower

Thailand has 12 public medical schools and one private school graduating 1,000 per year in total. There are 50 public nursing schools and nine private schools which produce 5,000 nurses every year. Since the number of doctors and nurses keeps increasing, their numbers per population have improved as the following table presents.

Health Personnel per Population

	1988	1989	1990	1991	1992	1993
Physician	4,832	4,361	4,500	4,425	4,282	4,260
Dentist	32,585	26,316	24,656	23,530	21,497	20,841
Nurse	1,065	962	929	885	828	788

However, there is a wide gap in distribution of health manpower between urban and rural areas. In addition, due to the wide salary differential between public and private hospitals, an unprecedented outflow of doctors, dentists, and other health personnel has occurred from the public to the private sector. Salaries in private hospitals are at least double those of public hospitals. The percentage of dentists working in the private sector is said to have reached 50 to 60 per cent. The figures in the table below show much smaller percentages due to underreporting.

Per cent of Health Personnel in the Private Sector

Personnel	1988	1989	1990	1991	1992	1993
Physicians	9.45	14.12	15.47	18.01	19.04	18.62
Dentists	13.59	19.45	20.08	22.59	24.20	23.54
Nurses	6.35	8.36	8.62	9.58	10.19	10.40

This "brain-drain" from the public to the private sector is an urgent concern because private hospitals are not under the control of MOPH at present.

(3) Health Insurance

Health security in Thailand is based on a mixture of two approaches: (i) public assistance to the indigent, and (ii) social insurance by pooling resources and risks among individuals. The existing health insurance and health welfare schemes can be categorized into four main groups as Table 2.3.2 summarizes :

(i) public assistance to indigents (the poor, the elderly over 60, children under 12);
(ii) health benefits for government workers (civil servant medical benefit scheme);
(iii) compulsory health insurance (social security scheme); and
(iv) voluntary health insurance (health card and private insurance).

The largest scheme is public assistance to low-income individuals, which covers 21 per cent of the total population. The administration of health security is not yet efficient, because there are such problems as double counting in the target groups. Also the limited administrative capacity of the social security scheme dictates that the insured can use only one hospital with which he or she has a contract. Moreover, nearly 30 per cent of the total population is not covered by any health security schemes in 1996.

3.2 Existing Conditions of Public Health in the WSB

3.2.1 Basic Health Indicators in the WSB

(1) Population and Family Planning

Due mainly to the achievement of family planning programs, population growth rates in the WSB have already decreased below 1 per cent except for Chumphon, while the national average was 1.1 per cent in 1995 (Table 2.3.3). Of married women of childbearing age, 74 per cent used contraception and the total fertility rate (number of children per woman) was 1.95 in Thailand. In the WSB the contraception rate is relatively higher than the national average, ranging from 66.0 per cent in Chumphon to 76.9 per cent in Prachuap Khirikhan and 85.2 per cent in Samut Songkhram. Popular family planning methods are the pill and injection, both of which account for more than

20 per cent in most provinces. Sterilization and the IUD are also prevalent, but the use of condoms is around 5 per cent.

(2) Basic Human Needs

Basic minimum needs such as water, latrine, and nutrition seem better provided in the WSB than the national average. The average percentage of households with clean drinking water in the Study Area is 88.8 per cent while the national average is 87.7 per cent. The ratio of households in the WSB having a sanitary latrine is 94.8 per cent, which is one percentage point higher than the national average. However, households which use piped water comprise around 5 per cent of the total and more than half of the households still use rain water for drinking in some provinces. As for vaccination coverage for children under one year, there is a wide disparity across provinces. The coverage for BCG is 100 per cent in Ratchaburi and Chumpon, but only 87.9 per cent in Samut Songkhram.

(3) Migration

The reduction of the population growth rate has affected the age structure in the Study Area. Working-age persons in the Study Area often move to urban areas like Bangkok. The percentage of the population over 60 years old varies from 12.4 per cent in Samut Songkhram, 11.3 per cent in Petchaburi, and 8.3 per cent in Chumphon, but in all of the provinces the proportions are higher than the national average (7.3 per cent).

Although the rate of natural population increase rate in the WSB has decreased rapidly, migration from other regions to the WSB is remarkable. Agricultural labor force from the Northeast and the North migrate to both industrial and agricultural areas in the Study Area; some settle down, but others move on to other places within few months or few years. In Petchaburi, for example, both in-migrants and out-migrants have started increasing after 1988. The share of the total number of in-migrants and out-migrants to total population was 10 to 15 per cent from 1988 to 1994.

(4) Infant Mortality Rate

Infant mortality rate, one of the most important health indicators, has already declined and was 25 per 1,000 live births in the whole Kingdom in 1995, according to an estimation by MOPH. However, infant mortality rates in the Study Area shown in the table below are much lower than that because of problems in statistical recording. Since

some of the birth and death registrations are still underreported to provincial health offices, many studies and surveys have shown widely varying infant mortality rates in different regions in Thailand.

However, available data indicate infant mortality rate (IMR) trends in the WSB. IMR has started to increase in some provinces because of vertical transmission of HIV from mother to children. The prevalence rate of HIV among pregnant women is rapidly increasing all over the Kingdom, but is especially high in some WSB provinces like Prachuap Khirikhan and Petchaburi. On the other hand, the reported IMR is increasing in some provinces like Kanchanaburi as the accuracy of statistics has been improved only recently. Improvement of the health information system should be considered.

Infant Mortality Rate in the Study Area

(unit: per 1,000 livebirths)

	1991	1992	1993	1994	1995
Kanchanaburi	1.89	3.23	4.12	4.10	4.66
Ratchaburi	-	7.22	5.18	7.54	7.75
Samut Songkram	-	-	-	-	7.06
Petchaburi	5.40	7.72	11.54	9.34	9.76
Prachuap Khirikh	5.35	3.84	8.15	6.15	5.49
Chumphon	3.19	5.06	4.57	9.51	15.8

3.2.2 Mortality and Morbidity

Table 2.3.4 presents the top ten leading causes of death officially reported in the Study Area. In all provinces, heart disease, all forms of cancer, respiratory system disease, and traffic accidents are leading causes of death.

Top Three Causes of Death in the WSB (1995)

Province	1	2	3
Kanchanaburi	Heart disease	Traffic accident	Cancer
Ratchaburi	Heart disease	Respiratory disease	Cancer
Samut Songkhram	Heart failure	Cancer	Respiratory infection
Phetchaburi	Heart disease	Traffic accident	Cancer
Prachuap Khirikhan	Senility	Traffic accident	Heart disease
Chumphon	Traffic accident	Heart disease	Cancer

(1) Traffic Accidents

A striking difference from the national trend of mortality is the rapid increase in traffic accidents in the WSB, especially in the southern WSB provinces along Route 4. The

majority of accidents occur on highways and in urban areas. The mortality rate (per 100,000 population) from traffic accidents in the WSB is higher than the national average according to MOPH data. In 1995, 1,308 people were killed in traffic accidents in the region. Prachuap Khirikhan had the highest number of fatalities because Route 4, the long north-south artery in the WSB, had only onelane at present in some sections. Most of the fatalities are motorcycle accidents as motorcycles account for 74 per cent of the vehicles in the region. Most motorcyclists drive over the speed limit without wearing a helmet. Some truck drivers are drunk, and some others use drugs such as amphetamines.

Emergency medical services, are not sufficient although Thailand is at the top of list of accident rates when compared to its neighbors and other industrialized countries. Every public hospital in the region has a emergency room and ambulances, but ambulances which often do not have cardiovascular equipment are used only for transferring patients from one hospital to another.

(2) Communicable Diseases

Major communicable diseases, especially those that could be prevented by vaccines, have caused less mortality and morbidity in Thailand. However, some of these diseases can still be found on the list of leading causes of death and morbidity. Table 2.3.5 indicates the leading causes of morbidity in the WSB. Diarrhea is by far the highest cause of morbidity in all six provinces. Diarrhea and food poisoning have not yet been reduced due to environmental problems related to sanitation, e.g., hygienic latrine, safe drinking water, and food sanitation. Malaria is still an important cause of death in some mountainous provinces such as Kanchanaburi. Although the mortality rate from malaria has been reduced, the morbidity rate still fluctuates up and down.

(3) Diseases Imported by Migrants from Myanmar

In areas along the border with Myanmar, the morbidity of malaria, filariasis, and leprosy is increasing because illegal Myanmar workers import these infectious diseases. Since there are very few official statistics on illegal workers, their exact number in the region is unknown. However, records by the Prachuap Khirikhan Provincial Health Office show that they have many Myanmar patients, both in mountainous and seaside areas, because they come to work in the region as farmers, fisherfolk, factory workers, and prostitutes. In 1994 and 1995, 745 foreign workers were checked for malaria by a local malaria station and more than 85 per cent tested positive. Also in community hospitals

along the border in Kanchanaburi and Chumphon, half of patients are from Myanmar. The increase of foreign workers is a financial burden because most cannot pay medical costs out of the pocket.

Number of Myanmar Patients in Hospitals in Prachuap Khirikhan (1995)

Community Hospital	No of Myanmar Patients				No. of Malaria Cases
	Burmese	Peguan	Karen	Total	
Hua Hin*	-	-	223	223	-
Kuiburi	8	-	7	15	2
Thapsakae	88	116	4	208	164
Bang Saphan	81	99	-	180	-
BangSaphan-Noi	5	14	-	19	1

* 1994 data

(4) Opportunistic Infections in AIDS Patients

The incidence of infectious diseases has fallen in Thailand, but mortality and morbidity from tuberculosis and other infectious diseases are increasing in the WSB because of opportunistic infections in AIDS patients. Thus, mortality rates from these infectious diseases have started to increase again in Ratchaburi, Petchaburi, and Chumphon.

3.2.3 HIV/AIDS

According to the HIV sentinel surveillance carried out by the MOPH every six months, Phayao and Chieng Mai in the North, Rayong along the Eastern Seaboard, and Petchaburi and Prachuap Khirikhan in the WSB are the most critical provinces in the HIV epidemic. These data a provide valuable indication of the levels of HIV infection among five different groups in all 76 provinces in Thailand. The results of the sentinel surveillance for June 1995 showing the top seven provinces in three groups are shown in the following table, which indicates that some provinces in the WSB have very high infection levels. The country medians of each group are 17.8 per cent for prostitutes, 8.1 per cent for male STD, and 2.3 per cent for pregnant women.

Top Seven Provinces in HIV Infection in Specific Groups (Sentinel Surveillance, June 1995)

	Prostitutes	Male STD* patients	Pregnant women
1	**Kanchanaburi** (49.33 per cent)	Phayao (42.86 per cent)	Phrae (9.86 per cent)
2	Phayao (44.58)	**Petchaburi** (25.00)	Phayao (8.38)
3	Nan (44.00)	Chiengmai (24.47)	Maehongsorn (7.98)
4	**Ratchaburi** (34.71)	Pathumtani(23.53)	Rayong (7.82)
5	Lampang (34.21)	Nakonratcahsema (23.1)	Chiengmai (6.95)
6	Nan (33.96)	Nan (19.00)	**PrachuapKhirikhan** (6.00)
7	**Prachuap Khirikhan** (32.86)	**Ratchaburi** (18.52)	**Petchaburi** (4.38)

* STD (sexually transmitted diseases)

Table 2.3.6 shows the number of AIDS patients in the WSB. In 1995 there were 544 patients in Ratchaburi, 501 in Phetchaburi, 418 in Kanchanaburi, 239 in Prachuap Khirikhan, 218 in Chumphon, and 147 in Samut Songkhram. The data on the number of AIDS patients per population indicate that the WSB ranks as the third highest in prevalence of the disease.

No of AIDS Patients per Population by Region (as of Apr. 1996)

Rank	Region	No. of AIDS Patients per Population
1	North	1.17
2	East (ESB)	0.83
3	WSB	0.72
4	BMR	0.46
5	South	0.33
6	Northeast	0.21
Average of Kingdom		0.58

Analysis of the number of AIDS patients by risk factor (Table 2.3.7) shows that 79.5 per cent of HIV infections in the Study Area are attributed to sexual transmission. Although decreasing, infections among Injection Drug Users (IDU) remains high in the region. The average percentage of IDU in the region is 9.6 per cent, which is higher than the national average of 7.1 per cent, especially in Chumphon, where it accounts for 20 per cent of total cases. A rapid increase in HIV infections has also been noted for vertical transmission from mothers to children (5.2 per cent in the WSB). A large number of Thai housewives face the risk of HIV infection from sex with their husbands or sex partners. Women often lack control over their sexual life and have difficulty in persuading their husbands to use a condom. Since the pill and injection have been the most popular contraception methods in Thailand for several decades, couples still dislike use of the condom even though they have knowledge of AIDS.

Table 2.3.8 indicates that general labor (including factory workers and construction workers) and farmers are the majority occupations of AIDS patients in the Study Area.

The customers of low-priced prostitutes and IDUs come from these occupational groups. It is noted that brothels are often located near construction sites and factories. The WSB region is absorbing a high number of migrants from other regions such as the North and the Northeast who work as wage laborers and have low educational levels. Fisherfolk are also among the high risk group in the WSB because they often go to low-priced brothels after working offshore for a long time. It is likely that more than half of the fishermen in the WSB are from Myanmar.

3.2.4 Occupational Health

The Thai economy has undergone a dramatic structural change from an agricultural economy with more people now involved in industrial sectors such as textiles, electronics, and food processing. As a result, the number of reported cases of occupational injuries and diseases has increased sharply year by year. In 1993 more than 156,000 accidents occurred in 34,772 workplaces in the whole Kingdom. The rate of industrial accidents was 40 per 1,000 workers, while the fatality rate is 25 per 100,000 workers. In fact, as many as 5 to 10 times more accidents are said to occur, with underreporting due to the limited coverage of the Workmen's Compensation Fund (WCF). The general industrial accident rate in Thailand is also high. Serious accidents such as chemical explosions, the overturning of construction cranes, and the collapse of buildings and construction scaffolding have become social problems.

Two thirds of the total Thai labor force engaged in agriculture are outside the scope of the protective provisions of labor laws, although the incidence of pesticide poisoning is much greater than that of occupational diseases in the industrial sector.

In the WSB, as Table 2.3.9 shows, Ratchaburi and Kanchanaburi have a larger number of labor accidents because they have more factories than other provinces. More than 95 per cent of the factories in the region have less than 50 workers. In Ratchaburi, the most potentially dangerous industries are steel, ceramics, and food processing. In Kanchanaburi, the food processing, construction, and hotel industries often have serious accidents. Among many kinds of causes of labor accidents, machines are one of the worst causes because they often lead to serious accidents such as those involving organ losses.

Table 2.3.10 indicates the number of fatalities and disabilities by labor accidents in the region. Attention should be paid to work scheduling because there are many night

workers in a three-shift system. Risks relating to safety at work such as sleepiness or difficulty in machine repair are often observed at night. However, due to the severe shortage of labor inspectors, who assess the importance of occupational hazards and improvement of working conditions, the number of inspected establishments is less than 10 per cent in the Western region (Table 2.3.11).

Most factories in the region are small-scale enterprises which do not have well-organized safety control measures. Since managers have paid little attention to health and safety, more than half in the WSB have rejected inspection by provincial health officers. Although there is little data on environmental health, the negative impact on health of air and water pollution is already a great concern for people living near industrial areas. In some areas, residents near industrial estates have stopped drinking rain water because they consider it polluted, but the provincial health offices have no authority to force enterprises to improve the situation. In addition, the number of occupational doctors is definitely short, though diagnosis of occupational diseases requires technical knowledge.

3.2.5 Health Services and Manpower

(1) Health Personnel

Provinces in the WSB lack health personnel, especially doctors, in comparison with other regions.

Doctors per population by province and region

Province	Doctors per Population	Region	Doctors per Population
Kanchanaburi	1: 9,615	Northeast	1: 10,740
Ratchaburi	1: 3,804	**WSB**	1: 7,441
Samut Songkhram	1: 6,323	North	1: 6,318
Petchaburi	1: 9,209	South	1: 5,968
Prachuap Khirikhan	1: 7,050	Central	1: 5,548
Chumphon	1: 8,655	Bangkok	1: 915
Average in the WSB	**1: 7,441**	**Average in Thailand**	**1: 4,295**

The number of hospitals in the WSB is sufficient because almost all districts have one community hospital (Table 2.3.12). However, as the table above shows, the Study Area has significantly lower levels of health personnel in comparison with other regions (Table

2.3.13). Even in Ratchaburi, the only province in the region whose figure is better than the national average, the number of doctors in community hospitals is insufficient at the district level. The standard for doctors in community hospitals, given by MOPH, indicates that a community hospital with 30 beds should have five doctors while in reality only one to three doctors work in one community hospital. The target number of doctors for community hospital in Chumpon, for example, is 66, but they have only 27 doctors in the province. Doctors in community hospitals have to see about 200 outpatients per day, in addition to inpatients and a night shift every few days. The shortage of physicians in the Study Area is critical.

The new graduates from public medical schools are now obligated by MOPH to work in rural public hospitals for three years. However, after working for three years, they tend to move to urban areas like Bangkok or to private hospitals. The WSB has no medical schools and only three public nursing colleges. The distance from Bangkok is another obstacle in attracting doctors, especially in the southern part of the WSB.

(2) Private/Public Mix

The Thai health care system has a pluralistic public/private mix in both the delivery of care and financing. The government adopts a laissez-faire policy toward private providers. Private providers, which already account for 21.9 per cent of total beds in the WSB, are increasing rapidly (Table 2.3.14) and people prefer to use private hospitals if they can afford it. In terms of quality of services, the common complaints related to public hospitals are (i) slowness, (ii) long queues, (iii) poor services, (iv) impoliteness, and (v) apathetic staff. Complaints about prices and medical skills are more frequently found in private hospitals. The growth of the private sector gives more choice to patients in health care and relieves the over-burden of public sector. However, a coordination and referral system between the two sectors has not been working yet.

The number of health personnel that have left the public sector for the private sector is not clear because MOPH does not have precise data on the private sector other than the number of hospitals and hospital beds. In Chumphon 4.2 per cent of the doctors, 9.1 per cent of the dentists, and 4.7 per cent of the nurses in public hospitals resigned in 1995. These figures seem very low, but many health personnel in the public sector work part-time in private hospitals.

3.2.6 Health Financing System

The coverage rates of health insurance in the WSB are 58.4 per cent in Kanchanaburi, 91.8 per cent in Ratchaburi, 80.0 per cent in Samut Songkhram, 77.3 per cent in Petchaburi, 57.9 per cent in Prachuap Khirikhan, and 78.0 per cent in Chumphon. Those who are not covered by any schemes seem to be the very rich and the near poor.

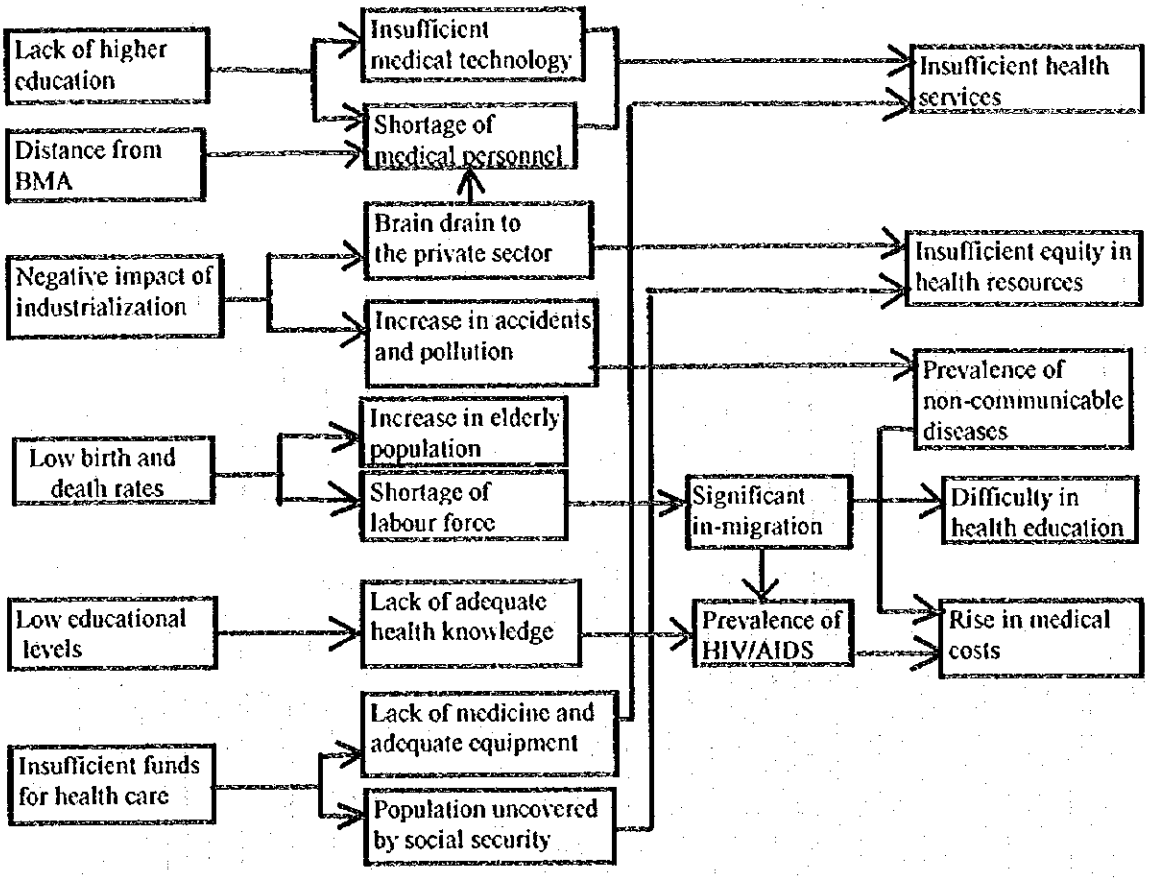
Less than half of the recurrent cost of public hospitals is provided directly by MOPH. In addition, they can retain all user fees and donations from the community. There are large variations in financing among different MOPH hospitals. The percentage of a hospital's total revenue coming from the government budget ranges from 20 to 60 per cent in the Study Area. User fee revenue is collected from patients on a fee-for-service basis (mostly the sale of medicine) and reimbursements from insurance plans. Often a major portion of user reimbursement comes from patients covered by the civil servant benefit scheme, which pays hospitals their full charges. Also, hospitals are able to increase their revenues by making contracts with patients who work in the formal sector, covered by the social security scheme, which pays a 800 Baht subsidy per patient to each hospital. However, in most community hospitals located in rural areas, more than half of patients are covered by free medical care schemes which reimburse only a small portion of hospital's real expenditures. The improvement of financial management is a critical issue in hospital services.

3.3 Objectives and Strategy for Public Health Development in the WSB

3.3.1 Public Health Problems in the WSB

The following figure explains important factors and main interrelationships among public health problems in the WSB.

Figure 3.3.1 Problem Structure of Public Health in the WSB



Although the Study Area has achieved relatively good health status in comparison with the national average, there are several problems caused by the factors illustrated above. These factors may be classified into two types: factors specific to the WSB and factors in common with the rest of the Kingdom.

Factors such as distance from the BMA, labor shortages and significant in-migration are specific to the Study Area. Distance from the BMA aggravates the shortage of medical personnel, which worsens the inequity of health services provision. Especially district-level health facilities suffer from insufficient manpower, equipment, and budget. Significant in-migration caused by the labor shortage in the region poses serious social problems. These migrants, who are in general poorly educated, have high mobility because the WSB is at the crossroads between other regions in Thailand and between Thailand and other Asian countries. Thus identifying their number and giving them an education are difficult. High-risk groups in terms of HIV/AIDS prevalence in the WSB are migrants such as fisherfolk, factory workers, truck drivers, prostitutes, and foreign

workers such as those from Myanmar. The increase of these groups may change communities and the social structure as a whole in the region.

Other factors causing problems such as the lack of higher education and the negative impact of industrialization are common in Thailand. As a result, major health problems in the WSB are: (i) insufficient health services, (ii) inequity in health resource distribution, (iii) prevalence of non-communicable diseases including accidents, (iv) difficulty in health education, and (v) rise in medical costs.

3.3.2 Objectives for Public Health Development in the WSB

(1) Existing Plans for Public Health Development

Eighth Plan for National Development

The NESDB has set the main policy of the 8th National Economic and Social Development Plan (1997-2001) to emphasize human quality development. According to this plan, the government aims :

- to increase human potentials in terms of physical well-being, health, intellect, and vocational skills;
- to strengthen family and community, support human development, increase quality of life, and increase community development in national development ; and
- to improve the national resources and environment such that they can advance economic and social development and quality of life.

NESDB also prepared the "Direction for Thailand's Public Health Development in the Next Decade" in 1994. The core concept is to reform the national health system by placing high priorities on disease prevention and health promotion, upgrading public health services, reforming the financial system, and reforming the health insurance system, as well as reforming the health personnel production and development system.

Eighth Plan for Public Health Development

In 1995, MOPH put emphasis on the following health issues:

- universal coverage of health security;
- improvement of quality of health services;
- health manpower development;

- promotion of health education and public relations; and
- consumer protection concerning foods and drugs.

The 8th National Health Development Plan (1997-2001), which will be implemented by MOPH, focuses on human development as well. Since the remarkable economic development in recent years has caused serious health problems, the development of human potential will be the main target of the 8th Plan. The seven main policies of the 8th Health Development Plan have been formulated as follows :

- improve the efficiency of health administration, management and financing;
- improve the quality and efficiency of health services at all levels including the private sector;
- upgrade health promotion and communicable disease control including AIDS and occupational health;
- improve consumer protection;
- develop health personnel to be sufficient in number and capability;
- improve community participation in PHC (primary health care), and health behavior; and
- upgrade medical technology.

(2) Public Health Development Objectives for the WSB

The overall objective of public health development is to provide appropriate and adequate health care, relevant to local needs, with equal access so that local people can enjoy a higher quality of life. Development objectives for the WSB have been defined based on the problem analysis, in line with the existing plans, to achieve this overall objective.

The objectives for public health development for the Study Area are:

(i) To narrow the gap with the national average in terms of provision of adequate and high-quality health services;

(ii) To empower local people and promote people's participation by giving appropriate health education through a community-based approach; and

(iii) To improve health status by improving the quality and efficiency of health services in both curative and preventive care.

3.3.3 Strategy

Public health development strategy for the WSB, which aims at solving each of the five public health problems analyzed in Section 3.1, is addressed below.

(1) To Improve Health Services by Mobilizing More Resources

To coordinate the private and the public sector to expand health services

The region already has an adequate number of public hospitals. The number of beds in most provincial and some community hospitals in the WSB will increase as a result of a project to upgrade hospital facilities budgeted by MOPH. MOPH will implement another project in line with the 8th Five Year Plan to upgrade existing public hospitals in selected industrial areas to provide adequate occupational and environmental health. Bang Saphan (community) hospital has already been nominated for this project. In addition, OECF will initiate a project to provide medical equipment in each provincial hospital in 1997. The facilities of public hospitals will be improved through these projects.

Therefore, the primary issue in the Study Area is the severe shortage of health personnel and maldistribution of health resources. MOPH has already decided to implement two national-level programs: i) to increase the number of medical school graduates from 1,000 to 2,000 per year, and ii) to subsidize public health facilities to increase physician's salaries. However, the concentration of health personnel in the BMA and urban areas cannot be expected to be revised due to the increased demand for private medical care and the large salary differentials between the private and the public sector.

To establish coordination and a network between the public and the private sector would be indispensable because the number of private hospitals and doctors working in the private sector will definitely increase in the region. Since the resources of the public sector are limited in terms of budget and manpower, utilizing private resources would be the most efficient choice for the region. According to the scenario for WSB social development, the middle class will increase as urbanization in the region increases. The WSB should have policies on private hospital investment in order to integrate the private sector into a comprehensive health development plan for the region. Otherwise, an appropriate public/private mix in the provision of health services cannot be established.

To improve the health manpower development system

To strengthen deployment of health personnel, the supply and quality of health personnel are important. As for deployment, priority should be put on under-served areas to guarantee equal access to health services for the whole population in the Study Area. More incentives should be given to health staff working in remote areas. An increase in the number of students in institutions in the region such as public nursing schools would be desirable. The training program for teachers in these schools should be upgraded and policies to increase the number of teachers are also necessary. The establishment of private medical, nursing, and pharmacy schools may improve the shortage of manpower.

Additional technical training for health personnel both in hospitals and provincial health offices is recommended. Training programs should be considered to cope with changing health needs. Programs for occupational health, environmental health, mental health, home visiting for the elderly, and self-care to prevent non-communicable diseases will become more important.

(2) To Revise Health Promotion Programs

To improve health behavior and the self-reliance of people

A lack of adequate health knowledge due to low educational levels is a critical issue in the whole Kingdom. Although MOPH and each provincial health office already have carried out many health education programs, the effectiveness and quality of health education seem insufficient to tackle changing health issues. For example, although most Thais understand how to prevent HIV infections as a result of the national AIDS control campaign, the number of HIV infections is still increasing especially among persons with little education. Since the lack of higher education is a most serious social issue, innovation in health education programs should be pursued.

Food-borne and non-communicable diseases could be prevented to some extent by increasing health awareness. Health promotion should emphasize encouraging public participation so that they can solve health problems in accordance with social changes. Knowledge of traditional medicine, consumer protection, and self-care would be fundamental. Moreover, strengthening the self-reliance of people may address the escalation of medical costs.

To involve non-governmental sectors

Health promotion should not be pursued only by the public sector; private and non-governmental sectors such as the mass media, industry, universities, NGOs, and

communities should be involved. As shown by a recent successful anti-tobacco campaign in Thailand, television and newspapers have much influence and effect in changing health behaviors. Health education, for instance, for workers especially in small and medium size domestic enterprises is essential to prevent occupational injuries and diseases. Collaboration with industries is also expected to develop effective and non-discriminatory measures for AIDS control. The program on living with AIDS could be expanded through community-based care that can be carried out by strengthening existing primary health care organizations.

To mobilize more qualified personnel for health education

More budget should be spent for health education because implementing effective health education requires highly qualified personnel who have much experience in education. Restructuring training programs for staff involved in health education is also necessary.

(3) To Provide a Healthy Environment

Since the Study Area is expected to become more industrialized and urbanized, the deterioration of natural resources and environment will affect the health of the local population through air pollution, water pollution, and toxic substances. Industrial wastes disposed from industries can have long-term effects on health such as insecticide poisoning, lead poisoning, and silicosis. At the same time, urbanization will inevitably increase the number of traffic accidents.

Lessons of the ESB (Eastern Seaboard) should be learned to safeguard health in the WSB. After the rapid industrialization of the ESB, many types of social problems rapidly increased: occupational accidents, deterioration of health through air pollution and waste water, traffic fatalities, and AIDS cases.

In addition to environmental surveillance and health education, broad collaboration among other government agencies such as the Ministry of Interior, Ministry of Labor and Social Welfare, and BOI will be essential to lessen the negative impact of industrialization on health in the region.

(4) To Strengthen Management Capacity in the Health Sector

To improve efficiency in hospital management both in the public and private sectors

Since most public hospitals suffer from budget shortages, the efficiency with which hospital managements use limited resources is important. Each hospital director should

try to increase the efficiency of hospital management both of finance and personnel through activities such as increasing donations from the community, providing education on self-care to decrease the number of patients with minor diseases, and minimizing waste as far as possible to reduce expenditure.

Private hospitals that have affluent resources tend to abuse high-cost medical technologies and to prescribe unnecessary drugs. Control of the oversupply of health resources and cost containment should be made through a financing mechanism.

To upgrade the health information system

At present, a few provinces such as Ratchaburi have a LAN system in all health facilities down to health centers at the sub-district level. Investment in computerized information system is necessary for better planning, monitoring, and evaluation of health services. Epidemiological records and health information by provincial health offices do not cover private health facilities at present, but more effort should be made to involve the private sector in information sharing. This would strengthen the planning capability of each health office to cope with changing health issues and health needs in the Study Area.

3.4 Projects

The WSB Master Plan estimates the total population of the region in 2011 will be 3.3 million with growth at 1.2 per cent per year. A major change anticipated in the following decade is rapid urbanization. Urban population is estimated to increase from 25 per cent in 1995 to 47 per cent in 2011. Rapid urbanization and industrialization lead to complicated health problems such as traffic accidents, AIDS, environmental health, mental disorders, and consumer related problems, all of which will become much more important in the region. Possible projects are listed below.

(1) Medical Research Laboratory with Hospital

The WSB region faces serious shortages in health personnel. How to attract qualified health personnel is a key issue. This project aims at upgrading medical research capability and medical technology within the region. A network of health research would be established linking existing medical and research facilities in the WSB and the BMA. The central facility would be established within the proposed Science City at Petchaburi, which would permit the realization of economies of scale in science and technology ventures. Alternatively, the Health System Research Institute in Bangkok

may open a branch in the WSB so that more research on health systems could be more actively promoted in the region.

(2) Regional Occupational Health Center

The number of industrial injuries and occupational diseases will increase with economic development in the region. An adequate number of occupational doctors and labor inspectors will be necessary to protect workers' health and safety. The proposed regional occupational health center would cover cases in the industrial and agricultural sectors.

(3) Emergency Medical Services Upgrading

Traffic accidents are one of three major causes of death in the WSB and the number of fatalities is expected to increase. Equipment in the emergency room and ambulances in each hospital should be upgraded and the emergency medical system should be reorganized to provide quick and adequate first aid with improved local transportation networks. In addition, a First Aid Center for Emergencies should be established at the sub-district level.

(4) Integrated HIV/AIDS Control

The Study Area is one of the critical regions affected by the HIV epidemic, and the number of AIDS patients is expected to increase as the WSB will receive a large number of in-migrants with different backgrounds. Integrated HIV/AIDS Control includes health education for factory workers and foreign workers as well as a training program for village health volunteers to strengthen community-based care for AIDS patients.

(5) Health Promotion Upgrading

Health development must encourage public participation so that people can solve health problems by themselves. This project aims at empowering people for self-reliance utilizing local knowledge of traditional medicine, herbal drugs, and community participation in consumer protection. Involvement of the private sector such as universities and NGOs would be encouraged.

Profiles of the proposed projects are presented in Appendix III.

Table 2.1.1 Population in Western Seaboard, Whole Kingdom, Bangkok, and Areas Outside Bangkok 1981, 1990, and 1994 (in thousands)

	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Phachuap Kirikhan	Chumphon	Study Area	Whole Kingdom	Bangkok (BMA)	Non-Bangkok
1981 Population	536	654	372	199	382	343	2,486	47,718	5,006	42,712
1990 Population	642	736	402	191	412	392	2,775	55,839	6,198	49,641
1994 Population	668	767	419	199	428	415	2,896	58,713	6,778	51,935
Growth Rates:										
1981-1994							1.2%	1.6%	2.4%	1.5%
1981-1990							1.2%	1.8%	2.4%	1.7%
1990-1994							1.1%	1.3%	2.3%	1.1%

Source: 1981 data from National Economic and Social Development Board, *National Accounts*; 1990 and 1994 data from National Economic and Social Development Board, Population Projections for Thailand, 1990-2020.

Table 2.1.2 Population Projections for Western Seaboard 2005 to 2011

Year	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Khirikhan	Chumphon	Study Area	Whole Kingdom	Bangkok (BMA)	Non-Bangkok
2000	701,544	805,940	440,769	209,355	449,622	447,211	3,054,441	62,405,000	7,637,000	54,768,000
2001	704,605	809,677	442,858	210,284	451,547	451,706	3,070,677	62,914,000	7,775,000	55,139,000
2002	709,616	815,657	446,175	211,794	454,720	455,809	3,093,771	63,430,000	7,917,000	55,513,000
2003	714,119	821,056	449,175	213,154	457,568	460,105	3,115,177	63,959,000	8,066,000	55,893,000
2004	720,130	828,193	453,126	214,964	461,382	464,461	3,142,256	64,492,000	8,218,000	56,274,000
2005	724,015	831,755	454,887	216,061	464,024	470,033	3,160,775	65,034,000	8,375,000	56,659,000
Growth Rate (% per annum)	0.6553	0.6631	0.666	0.666014	0.652941	0.976517	*/	0.825562	1.846048	0.679062
					Projected Population					
2006	728,759	837,270	457,917	217,500	467,054	474,623	3,183,123	65,470,000	8,533,000	56,937,000
2007	733,535	843,022	460,966	218,949	470,103	479,258	3,205,832	65,938,000	8,677,000	57,261,000
2008	738,342	848,812	464,036	220,407	473,172	483,938	3,228,707	66,190,000	8,776,000	57,414,000
2009	743,180	854,643	467,127	221,875	476,262	488,663	3,251,749	66,690,000	8,943,000	57,747,000
2010	748,050	860,513	470,238	223,352	479,371	493,435	3,274,960	67,230,000	9,122,000	58,108,000
2011	752,952	866,424	473,370	238,228	482,501	498,253	3,311,728	67,712,000	9,290,000	58,422,000

Source: Human Resources Planning Division, National Economic and Social Development Board, *Population Projections for Thailand, 1990-2020* , Bangkok, March 1995.

*/Study area calculated as the sum of the projected populations for the individual Provinces.

Table 2.1.3 Population Projections By Gender, Age 2011

	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Kirikhan	Chumphon	Study Area	Whole Kingdom	(BMA) Bangkok	Non-Bangkok
Males										
0-14	93,548	97,845	55,589	26,265	57,676	70,088	401,011	7,552,000	761,000	6,791,000
15-24	66,657	71,044	43,421	18,210	44,420	41,851	285,604	5,382,000	683,000	4,699,000
25-29	34,844	36,586	20,995	9,222	22,326	19,665	143,637	2,817,000	432,000	2,385,000
30-44	89,381	100,823	53,919	26,615	54,653	59,247	384,638	8,270,000	1,239,000	7,031,000
45-59	54,538	69,342	37,934	20,662	33,257	38,322	254,054	6,109,000	863,000	5,246,000
60-64	9,847	14,889	7,873	4,319	6,512	7,816	51,256	1,250,000	153,000	1,097,000
65 +	29,920	34,884	18,848	11,440	13,721	15,127	123,940	2,321,000	257,000	2,064,000
Total	**378,735**	**425,414**	**238,578**	**116,732**	**232,565**	**252,116**	**1,644,141**	**33,701,000**	**4,388,000**	**29,313,000**
Females										
0-14	92,823	93,177	51,020	25,166	62,301	67,110	391,597	7,311,000	809,117	6,501,883
15-24	65,752	69,085	38,271	16,622	43,318	40,175	273,224	5,262,000	830,809	4,431,191
25-29	34,027	36,348	18,945	7,593	22,621	18,825	138,359	2,740,000	520,611	2,219,389
30-44	87,591	102,391	53,109	26,499	57,415	54,484	381,489	8,015,000	1,259,228	6,755,772
45-59	58,150	76,910	41,064	24,784	38,591	38,678	278,177	6,396,000	925,002	5,470,998
60-64	11,105	18,080	9,101	5,533	7,994	8,670	60,483	1,390,000	187,637	1,202,363
65+	24,768	45,019	23,281	15,298	17,694	18,196	144,257	2,897,000	366,597	2,530,403
Total	**374,217**	**441,010**	**234,792**	**121,496**	**249,936**	**246,137**	**1,667,588**	**34,011,000**	**4,899,000**	**29,112,000**
Total										
0-14	186,371	191,022	106,609	51,431	119,977	137,198	792,608	14,863,000	1,570,117	13,292,883
15-24	132,409	140,129	81,692	34,832	87,738	82,026	558,828	10,644,000	1,513,809	9,130,191
25-29	68,871	72,934	39,940	16,815	44,947	38,490	281,996	5,557,000	952,611	4,604,389
30-44	176,972	203,214	107,028	53,114	112,068	113,731	766,127	16,285,000	2,498,228	13,786,772
45-59	112,688	146,252	78,998	45,446	71,848	77,000	532,231	12,505,000	1,788,002	10,716,998
60-64	20,952	32,969	16,974	9,852	14,506	16,486	111,739	2,640,000	340,637	2,299,363
65+	54,688	79,903	42,129	26,738	31,415	33,323	268,197	5,218,000	623,597	4,594,403
Grand Total	**752,952**	**866,424**	**473,370**	**238,228**	**482,501**	**498,253**	**3,311,729**	**67,712,000**	**9,287,000**	**58,425,000**

Source: Human Resources Planning Division, National Economic and Social Development Board, *Population Projections for Thailand, 1990-2020,* Bangkok, March 1995, and Study Team estimates.
Possibility of minor discrepencies due to rounding.

Table 2.1.4
Percentage Distributions of Households in the Western Seaboard by Monthly Household Income and Expenditures
1994
(Baht per Month)

	Monthly Consumption		Monthly Income	
	Percentage Distribution	Cumulative Distribution	Percentage Distribution	Cumulative Distribution
Total Households	790,450			
Monthly Consumption Exp.				
Less than B 1,000	0.46	0.46	1.38	1.38
1,000 - 1,499	1.49	1.95	3.47	4.84
1,500 - 1,999	3.78	5.74	4.68	9.52
2,000 - 2,499	4.65	10.38	7.6	17.12
2,500 - 2,999	5.7	16.08	6.78	23.90
3,000 - 3,499	7.65	23.73	6.4	30.30
3,500 - 3,999	9.01	32.74	5.97	36.27
4,000 - 4,499	7.32	40.07	7.03	43.30
4,500 - 4,999	9.13	49.20	5.07	48.37
5,000 - 5,999	13.23	62.43	8.82	57.19
6,000 - 6,999	9.29	71.72	8.33	65.52
7,000 -7,999	6.54	78.26	7.17	72.69
8,000 - 8,999	4.77	83.03	3.23	75.92
9,000 - 9,999	2.92	85.95	4.48	80.40
10,000 - 10,999	2.75	88.70	3.26	83.66
11,000 - 12,999	3.31	92.01	3.89	87.55
13,000 - 14,999	1.75	93.76	2.12	89.67
15,000 - 19,999	2.32	96.08	3.95	93.61
20,000 - 29,999	2.12	98.20	4.13	97.74
30,000 and over	1.71	99.91	2.17	99.91

Source: National Statistical Office, Preliminary Tabulations from *1994 Income and Expenditure Survey.*

Table 2.1.5
Percentage Distribution of Households in the Western Seaboard, By Socio-Economic Characteristics, Monthly Income and Expenditure, 1994
(Baht)

Socio-Economic Category	Average Household Size	Average No. of Income Recipients	Average No. of Earners	Average Household Consumption Expenditure	Average Household Monthly Income
All Households	3.75	1.78	2.08	6,804	7,795
Farm Operators	3.85	1.43	2.40	7,019	7,009
Own Account, Non-Farm	3.79	1.68	2.14	8,964	11,145
Employees:	3.89	2.08	2.17	6,824	7,729
Prof. Workers, Sales, etc.1/	3.87	2.05	2.13	9,233	12,149
Farm, General Workers2/	3.95	2.12	2.22	4,914	4,864
Economically Inactive	2.88	1.49	1.20	5,653	5,958

Source: National Statistical Office, Preliminary Tabulations from *1994 Income and Expenditure Survey.*

1/ Includes professional, technical and administrative workers, clerical, sales, and service workers.

2/ Includes farm workers, general workers, production and construction workers.

Table 2.2.1 Employed Persons by Levels of Educational Attainment Western Seaboard, Whole Kingdom, Bangkok, and Non-Bangkok Regions 1994*/

Level of Educational Attainment	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Khirikhan	Chumphon	Study Area	Whole Kingdom	Bangkok (BMA)	Non-Bangkok
Total	**376,874**	**435,995**	**248,262**	**95,592**	**242,581**	**208,981**	**1,608,285**	**30,164,293**	**3,339,753**	**26,824,540**
None	52,025	26,850	9,653	2,694	11,882	5,374	108,478	1,261,888	62,933	1,198,955
Less than Pratom 4	21,063	19,101	7,670	3,099	11,329	4,019	66,281	807,063	51,359	755,704
Lower Elementary	179,213	221,774	128,571	45,383	114,560	101,483	790,984	14,322,200	1,028,770	13,293,431
Upper Elementary	84,055	95,112	54,946	25,673	60,388	55,811	375,985	7,333,656	566,703	6,766,953
Lower Secondary	18,517	29,880	16,612	6,811	21,478	20,791	114,089	2,449,541	407,231	2,042,310
Upper Secondary	7,671	11,406	8,402	2,921	6,111	4,719	41,230	925,077	196,487	728,590
Vocational	4,911	9,806	4,674	3,572	6,863	4,136	33,962	886,894	309,846	577,049
University:										
-Academic	1,762	7,590	6,094	1,055	3,182	3,997	23,680	936,059	463,608	472,451
-Tech/Vocational	1,776	6,266	3,555	2,470	2,476	4,550	21,093	592,713	162,970	429,743
Teacher Training	5,881	8,172	8,052	1,914	4,312	4,081	32,412	626,699	79,355	547,344
Short-course Vocational	0	38	33	0	0	20	91	6,255	2,220	4,035
Others	305	268	41	0	163	163	940	15,502	7,710	7,792
Unknown	0	0	0	0	0	0	0	748	561	187

Source: National Statistical Office, *1994 Labour Force Survey.*

*/ Average of data from 1st and 3rd rounds of survey. Possibility of minor discrepencies due to rounding.

	Percentage Distributions									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	13.8	6.2	3.9	2.8	4.9	2.6	6.7	4.2	1.9	4.5
Less than Pratom 4	5.6	4.4	3.1	3.2	4.7	1.9	4.1	2.7	1.5	2.8
Lower Elementary	47.6	50.9	51.8	47.5	47.2	48.6	49.2	47.5	30.8	49.6
Upper Elementary	22.3	21.8	22.1	26.9	24.9	26.7	23.4	24.3	17.0	25.2
Lower Secondary	4.9	6.9	6.7	7.1	8.9	9.9	7.1	8.1	12.2	7.6
Upper Secondary	2.0	2.6	3.4	3.1	2.5	2.3	2.6	3.1	5.9	2.7
Vocational	1.3	2.2	1.9	3.7	2.8	2.0	2.1	2.9	9.3	2.2
University:										
-Academic	0.5	1.7	2.5	1.1	1.3	1.9	1.5	3.1	13.9	1.8
-Tech/Vocational	0.5	1.4	1.4	2.6	1.0	2.2	1.3	2.0	4.9	1.6
Teacher Training	1.6	1.9	3.2	2.0	1.8	2.0	2.0	2.1	2.4	2.0
Short-course Vocational	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Others	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0

Table 2.2.2
School Facilities, Students, Classes, and Teachers
Western Seaboard, Whole Kingdom, Bangkok, and Non-Bangkok
(1995)

	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Khirikhan	Chumphon	Study Area	Whole Kingdom	Bangkok	Non-Bangkok
Number of Schools (Facilities)										
Primary Schools	503	406	266	118	282	309	1,884			
Second Schools	92	95	64	36	52	73	412			
Non Formal	0	0	0	0	0	0	0	Data Not Available		
Vocational	6	8	5	1	3	4	27			
Tertiary (University)	1	1	1	0	0	0	3			
Less: double-counting*/	60									
Total	542	455	301	131	306	338	2,073	36,690	1,146	35,544
Percent Private	4.8%	11.2%	4.3%	9.9%	9.8%	3.3%	7.2%			
Number of Students										
Primary Schools	80,588	79,422	42,364	18,563	49,085	48,894	318,916			
Second Schools	31,175	41,153	24,322	10,062	20,437	24,531	151,680			
Non Formal	48,925	38,079	30,794	10,289	42,404	603	171,094	Data Not Available		
Vocational	6,497	16,497	7,845	3,167	4,745	5,612	44,363			
Tertiary (University)	3,033	2,277	4,919	0	0	0	10,229			
Total	170,218	177,428	110,244	42,081	116,671	79,640	696,282	11,462,836	978,805	10,484,031
Percent Private	6.6%	19.6%	6.7%	8.8%	12.6%	5.2%	10.9%			
Number of Classes										
Primary Schools	3,641	3,098	1,987	905	2,126	2,240	13,997			
Second Schools	882	1,070	686	285	622	664	4,209			
Non Formal	1,370	995	1,103	657	1,364	908	6,397	Data Not Available		
Vocational	179	447	168	89	137	167	1,187			
Tertiary (University)	N/A	N/A	N/A	0	0	0	0			
Total	6,072	5,610	3,944	1,936	4,249	3,979	25,790			
Percent Private	5.3%	14.5%	4.5%	5.8%	9.1%	3.1%	7.5%			
Number of Teachers										
Primary Schools	4,428	4,429	919	1,392	2,847	2,530	16,545			
Second Schools	1,416	2,126	3,669	619	1,191	1,191	10,212			
Non Formal	1,009	766	997	3,172	1,156	603	7,703	Data Not Available		
Vocational	224	648	343	143	193	300	1,851			
Tertiary (University)	245	95	138	0	0	0	478			
Total	7,322	8,064	6,066	5,326	5,387	4,624	36,789	600,364	49,603	550,761
Percent Private	6.3%	15.3%	4.8%	2.9%	10.7%	3.3%	8.6%			

Source: Information Center, Ministry of Education

*/ Some primary schools have been expanded to accommodate lower secondary classes. In the raw data, these schools are counted as both primary and secondary schools.

Table 2.2.3 Population of Working Age, Labor Force, and Participation Rates, By Gender Employment, and Unemployment, Western Seaboard, Kingdom, Bangkok, and Non-Bangkok 1994*/

	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Kirikhan	Chumphon	Study Area	Whole Kingdom	Bangkok (BMA)	Non-Bangkok
Population										
13 and older	504,090	617,339	333,190	146,693	326,791	283,842	2,211,944	43,939,418	5,113,563	38,825,856
Male	250,095	297,645	160,945	69,047	162,946	141,346	1,082,024	21,680,309	2,431,533	19,248,776
Female	253,995	319,694	172,245	77,646	163,845	142,496	1,129,920	22,259,109	2,682,030	19,577,080
Labor Force	381,135	441,724	248,726	99,050	246,893	210,910	1,628,438	30,997,940	3,395,358	27,602,583
Male	207,011	230,570	130,988	52,989	136,167	112,416	870,141	17,125,940	1,860,766	15,265,174
Female	174,124	211,154	117,738	46,061	110,726	98,494	758,297	13,872,000	1,534,592	12,337,409
Labor Force										
Participation Rates	75.61	71.55	74.65	67.52	75.55	74.31	73.62	70.55	66.40	71.09
Male	82.77	77.46	81.39	76.74	83.57	79.53	80.42	78.99	76.53	79.30
Female	68.55	66.05	68.35	59.32	67.58	69.12	67.11	62.32	57.22	63.02
Employment	377,179	436,263	248,303	95,592	242,744	209,194	1,609,275	30,164,294	3,339,653	26,824,541
Unemployment	3,956	5,460	425	3,459	4,149	1,766	19,215	833,647	55,605	778,042
Unemp. Rate	1.04	1.24	0.17	3.49	1.68	0.84	1.18	2.69	1.64	2.82

Source: National Statistical Office, *1994 Labour Force Survey.*

*/Average of first and third rounds of 1994 survey. Partials adjusted to conform with totals. Possibility of minor discrepencies due to rounding.

Table 2.2.4
Employed Persons by Industry
Western Seaboard, Whole Kingdom, Bangkok and Non-Bangkok Regions
1994*/

Industry	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Khirikhan	Chumphon	Study Area	Per Cent Distribution	Whole Kingdom	Per Cent Distribution	Bangkok (BMA)	Non-Bangkok
Total	**377,179**	**436,263**	**248,303**	**95,592**	**242,744**	**209,144**	**1,609,225**	**100.0**	**30,164,293**	**100.0**	**3,339,756**	**26,824,543**
Agriculture, forestry, hunting and fishing	243,969	185,226	107,503	28,783	132,133	122,270	819,884	50.9	15,180,501	50.3	96,425	15,084,077
Mining and quarrying	126	1309	5769	2099	0	1722	11,025	0.7	57,838	0.2	3,476	54,362
Manufacturing	42,139	81,963	33,268	28,599	30,641	18,184	234,794	14.6	4,190,856	13.9	910,076	3,280,781
Construction, repair, and demolition	20,743	30,583	20,262	4,708	13,813	13,023	103,132	6.4	1,996,777	6.6	203,119	1,793,659
Electricity, gas, water, and sanitary services	441	1988	2783	796	626	647	7,281	0.0	183,958	0.6	59,987	123,971
Commerce	33,805	74,127	29,219	18,230	32,477	21,074	208,932	13.0	3,765,876	12.5	873,365	2,892,512
Transport, storage, and communications	7,222	12,034	4,758	4,322	5,523	7,915	41,774	0.0	894,904	3.0	276,969	617,936
Services	28734	49033	44,741	8055	27177	24,309	182,049	11.3	3,882,019	12.9	911,788	2,970,231
Activities not adequately described	0	0	0	0	354	0	354	0.0	11,564	0.0	4,551	7,014

Source: National Statistical Office, *Labour Force Survey, 1994.*

*/ Average of rounds 1 and 3 of 1994 survey. Possibility of minor discrepencies due to rounding.

Table 2.2.5
Distribution of Employment, By Occupation
Western Seaboard, Whole Kingdom, Bangkok, and Non-Bangkok Regions
1994*/

Occupation	Kanchanaburi	Ratchaburi	Petchaburi	Samut Songkhram	Prachuap Khirikhan	Chumphon	Study Area	Per Cent Distribution	Whole Kingdom	Per Cent Distribution	Bangkok (BMA)	Non-Bangkok	Per Cent Distribution
Total	**377,179**	**436,263**	**248,303**	**95,592**	**242,744**	**209,144**	**1,609,225**	**100.0**	**30,164,293**	**100.0**	**3,339,753**	**26,824,540**	**100.0**
Professional, technical and related workers	7,939	18,481	13,911	3,303	6,748	6,547	56,929	3.5	1,428,164	4.7	422,594	1,005,570	3.7
Administrative, executive and managerial workers	3,249	9,439	3,991	1,643	3,004	4,693	26,019	1.6	684,381	2.3	269,348	415,033	1.5
Clerical workers	4,986	10,502	6,514	3,957	7,074	7,782	40,815	2.5	1,149,127	3.8	441,136	707,991	2.6
Sales workers	32,348	67,001	28,873	13,866	29,775	19,861	191,724	11.9	3,308,384	11.0	559,984	2,748,400	10.2
Farmers, fishermen, hunters, loggers, and related workers	243,722	184,750	109,003	29,302	130,234	122,071	819,082	50.9	15,234,628	50.5	102,209	15,132,419	56.4
Workers in transport and communications	9,874	18,462	8,867	3,922	7,158	11,018	59,301	3.7	1,088,745	3.6	273,576	815,169	3.0
Craftsmen, production, process workers, and laborers, n.e.c.	61,473	108,778	63,382	36,867	45,091	26,121	341,712	21.2	5,906,954	19.6	891,533	5,015,421	18.7
Service, sport, and recreation workers	13,588	18,850	13,762	2,732	13,601	11,051	73,584	4.6	1,356,300	4.5	375,451	980,849	3.7
Workers not classifiable by occupation	0	0	0	0	59	0	59	0.0	7,610	0.0	3,922	3,688	0.0

Source: National Statistical Office, *Labour Force Survey, 1994.*

*/ Average of rounds 1 and 3 of 1994 survey. Possibility of minor discrepencies due to rounding.

Table 2.2.6
Estimated Employment in the Manufacturing Sector in the WSB by Category of Industry

	Employment (persons)							New Industry by Modern/Non-Modern Sector in 2011		
		2001			2011					
TSIC Total	1994	Exist	New	Total	Exist	New	Total	Non-Modern	Modern	Total
311-4 Food, Bevarage and Tobacco	152,692	157,681	51,983	209,664	165,404	102,691	268,095	71,163	31,528	102,691
321 Textiles	11,491	13,120	6,343	19,463	15,861	12,638	28,499	5,503	7,135	12,638
322 Wearing Apparel	278	302	20	322	336	32	368	32		32
323-4 Leather, leather Products and Footwear	555	614	258	872	707	496	1,203		496	496
331-2 Wood, Wood Products and Furniture	10,301	9,825	9,084	18,909	9,185	17,190	26,375	8,410	8,780	17,190
341 Paper and Paper Products	2,412	2,754	4,171	6,925	3,329	8,254	11,583	2,836	5,418	8,254
342 Printing and Publishing	593	849	63	912	1,414	122	1,536	122		122
351-4 Chemical and Petroleum Products	1,172	1,794	1,740	3,534	3,272	9,131	12,403		9,131	9,131
355-6 Rubber and Plastic Products	9,594	13,305	2,096	15,401	21,237	4,051	25,288	3,241	810	4,051
361-9 Non-Metallic Mineral Products	14,116	16,654	6,175	22,829	21,097	16,080	37,177	7,430	8,650	16,080
371-2 Basic Metal Products	729	1,426	5,510	6,936	3,712	15,913	19,625		15,913	15,913
381 Fabricated Metal Products	2,577	3,245	3,821	7,066	4,510	7,378	11,888	1,476	5,902	7,378
382-5 Machinery and Equipment	9,314	10,282	22,177	32,459	11,879	43,863	55,742		43,863	43,863
390 Other Manufacturing Industries	18,970	20,554	6,365	26,919	23,035	12,293	35,328	6,146	6,147	12,293
Total	234,794	252,405	119,806	372,211	284,978	250,132	535,110	106,359	143,773	250,132

Source: Volume 7, Table 7.5.11 and 7.5.12

Table 2.3.1 Trends in Major Health Indicators in Thailand

Indicator		Unit	Year	
			1988	1995
Life Expectancy		Male	63	66.6
		Female	68	71.7
Infant Mortality rate		per 1,000 live births	35.0	25.9
Crude Birth rate		per 1,000 population	17.0	16.5
Crude Death rate		per 1,000 population	4.2	6.1
Maternal Mortality rate		per 1,000 live births	0.40	0.14
Population over 60 years		% in total population	6.1	6.8
Family Planning rate		% receiving	70.5	74.0
Vaccination	BCG	% receiving	96.0	98.9
	measles vaccine	% receiving	80.0	83.6
Households with safe drinking water		%	74.0	87.8

Source: Health in Thailand, Ministry of Public Health

Table 2.3.2 Health Insurance and Medical Welfare Scheme in Thailand (1994)

	Coverage	Nature of scheme	Choice of hospitals	Financing	Copayment	inancing body
1.Free health care		social welfare	designated public hospital	taxation	no	MOPH
Low income	22.9%					
Aged over 60	4.6%					
Children under 12	16.0%					
Veterans	0.4%					
2. Civil Servant Medical Benifit Scheme	11.0%	fringe benefit	free	taxation	ate hospital(inpatient o	MOF
3. Social Security Scheme	7.3%	compulsory	registered hospital	payroll tax	maternity,emergency	SSO(MOL)
4. Voluntary Health Insurance						
Health card	7.8%	voluntary	designated public hospital	ousehold 500	(household 500B)	MOPH
Private health insurance	1.0%	voluntary	free	household	almost no	rivate company
TOTAL	**71.0%**					

Note : MOPH (Ministry of Public Health), MOF (Ministry of Finance), SSO (Social Security Office), MOL (Ministry of Labour and Social Welfare)

Source : Office of Health Insurance, Ministry of Public Health

Table 2.3.3 Basic Health Indicators in the WSB in 1995

Indicators	Kanchanaburi	Ratchaburi	SamutSongkram	Petchaburi	Prachuap Khirikhan	Chumphon	Whole Kingdom
Population	773,516	764,679	202,326	764,679	444,153	216,791	59,396,000
Population density	37	151	494	71	71	70	115.8
Population growth rate	0.71%	0.82%	0.58%	0.56%	0.91%	1.30%	1.10%
% of Population over 60	8.54%	8.01%	12.40%	11.30%	9.60%	8.34%	6.80%
Family Planning covera	73.37%	70.16%	85.15%	n.a.	76.99%	66.00%	74.00%
Maternal mortality rate*	0	0	0	0	0	0.27	0.1
Crude birth rate**	11.53	14.17	11.19	11.7	14.53	17.42	16.5
Crude death rate**	4.41	5.90	5.40	6.15	5.12	4.90	4.9

Note : *per 1,000 live births, **per 1,000 population

Source : Provincial Health Offices, May 1996

Table 2.3.4 Top 10 Leading Causes of Death in the study area (1995)

	Kanchanaburi	No.	per 100,000	Ratchaburi	No.	per #####	Samut Songkram	No.	per 100,000
1	Heart Disease	496	66.59	Heart Disease	750	98.1	Heart Failure	111	54.86
2	Traffic Accident	336	45.11	Respiratory System Disease	486	63.6	Cancer, all forms	106	52.39
3	Cancer, all forms	209	28.06	Cancer, all forms	328	42.9	Respiratory Infection	33	16.31
4	Respiratory System Disease	202	27.12	Other Accident	234	30.60	Hypertension	20	9.88
5	Other Accident	148	19.87	Hypertensive Disease	217	28.4	Traffic Accident	19	9.39
6	Unknown Fever	96	12.87	Liver & pancrease disease	175	22.4	Kidney disorders	19	9.39
7	Malaria	71	9.53	Traffic Accident	137	17.9	Cerebro-vascular Accident	15	7.41
8	Hypertension	62	8.32	Lymphatic & Immuno disease	130	17.00	Diabetes	13	6.42
9	Murder	54	7.25	Nepharitis	117	15.30	Liver & pancrease diseases	12	5.93
10	Hepatic Disease	46	6.17	Tuberculosis	113	14.8	Drown	9	4.45

	Phetchaburi	No.	per 100,000	Prachuap Khirikhan	No.	per #####	Chumphon	No.	per 100,000
1	Heart Disease	235	53.58	Senility	479	108	Traffic Accident	254	58.69
2	Traffic Accident	178	40.58	Traffic Accident	384	86.5	Heart Disease	246	56.84
3	Cancer, all forms	165	37.62	Heart Disease	312	70.5	Cancer, all forms	132	30.50
4	Other Accident	102	23.26	Respiratory Failure	207	46.8	Respiratory System Disease	91	21.03
5	Lower Respiratory Disease	66	15.05	Cancer, all forms	141	32	Murder	84	19.41
6	Hypertension	45	10.26	Fainting	97	22.1	Unknown Fever	77	17.79
7	Liver & Pancrease Disease	30	6.84	Other Accident	67	15.1	Hypertension	66	15.25
8	All Paralysis	29	6.61	Murder & Persecution	58	13.1	Other Accident	64	14.79
9	Suicide	24	5.47	Liver system disease	52	11.9	Digetive System Disease	49	11.32
10	Infectious Disease	8	4.10	Hypertension	42	9.46	Infectious Disease	47	10.86

Source : Provincial Health Offices, May 1996

Table 2.3.5 Top 10 Leading Causes of Morbidity in the study area (1995)

	Kanchanaburi	No.	per100,000	Ratchaburi	No.	er100,000	Samut Songkram	No.	per100,000
1	Diarrhea	16830	2253.02	Diarrhea	10082	1318.5	Diarrhea	3970	195.9
2	Malaria	12085	1617.81	Malaria	2495	326.28	PUO	659	32.5
3	PUO	3742	500.94	Pneumonia	2347	306.93	Influenza	592	29.2
4	Pneumonia	1965	261.85	Dengue haemorrhagic fever	891	116.51	Pneumonia	448	22.1
5	Conjunctivitis	1205	161.31	PUO	813	106.32	Dysentery	245	12.1
6	Food poisoning	1064	142.44	Food poisoning	747	97.69	Conjunctivitis	236	11.6
7	Influenza	1059	139.09	Conjunctivitis	735	96.12	Venerial disease	206	10.1
8	Dysentery	866	115.93	Influenza	566	74.02	Chickenpox	191	9.3
9	Mumps	750	100.40	Chickenpox	487	63.69	Dengue haemorrhagic fever	125	6.1
10	Dengue haemorrhagic fever	662	88.62	Snake bite	390	51.00	Food poisoning	102	5.0

	Petchaburi	No.	per100,000	Prachuap Khirikhan	No.	er100,000	Chumpon	No.	per100,000
1	Diarrhea	8147	1072.94	Diarrhea	7475	1683	Diarrhea	4531	2158.61
2	Malaria	2432	320.14	Malaria	1478	400.31	PUO	3034	1445.31
3	Influenza	1710	225.28	Pneumonia	1630	366.99	Malaria	871	415.49
4	Pneumonia	1010	133.81	PUO	1346	303.05	Dengue haemorrhagic fever	459	219.74
5	Food poisoning	957	126.11	Influenza	1121	252.39	Severe cold	417	199.64
6	Pyrexia	889	117.73	Food poisoning	681	153.32	Pneumonia	386	184.39
7	Conjunctivitis	585	77.43	Conjunctivitis	543	120.23	Conjunctivitis	273	130.09
8	Dengue haemorrhagic fever	507	59.77	Dengue haemorrhagic fever	510	115.28	Food poisoning	233	111.84
9	Tuberclosis	364	48.45	Gonorrhea	299	67.32	Intestinal infectious disease	138	66.55
10	Chickenpox	364	48.00	Chickenpox	259	58.31	Chickenpox	128	61.23

Source : Provincial Health Offices, May 1996

Table 2.3.6 No of AIDS Patients in the WSB from 1984 to 1995

	1984-88	1989-93	1994	1995	Total	No of Deaths
Kanchanaburi	0	69	161	188	418	133
Ratchaburi	0	124	240	180	544	145
Samut Songkram	0	30	53	64	147	40
Petchaburi	0	101	238	162	501	122
Prachuap Khirikha	0	58	104	77	239	76
Chumphon	0	38	85	95	218	62

Source : Regional CDC Center (Ratchaburi) 1995, Chumphon Provincial Health Office

Table 2.3.7 No of AIDS Patients by Risk Factor in the Study Area (as of Apr. 30, 1996)

Risk Factor	Kanchanaburi		Ratchaburi		Samut Songkram		Petchaburi		Prachuap Khirikha		Chumphon	
	No of cases	%	o of cases	%	o of cases	%	o of cases	%	o of cases	%	o of cases	%
Sexual Transmission	418	82.12	594	87.1	148	75.90	565	90.60	231	78.31	97	65.1
Homosexual	6	1.18	3	0.44	1	0.51	1	0.16	3	1.02	2	1.34
Bisexual	0	0.00	1	0.15	0	0.00	3	0.48	1	0.34	0	0.00
Male-heterosexual	346	67.98	524	76.83	133	68.21	497	79.78	193	65.42	77	51.68
Female-heterosezual	66	12.97	66	9.68	14	7.18	64	10.27	34	11.53	18	12.08
Injecting Drug Users	28	5.50	41	6.01	32	16.41	16	2.57	21	7.12	30	20.13
Male	28	5.50	41	6.01	32	16.41	16	2.57	20	6.78	30	20.13
Female	0	0.0	0	0.00	0	0.00	0	0.00	1	0.34	0	0.00
Blood Receive	0	0.00	1	0.15	0	0.00	0	0.00	0	0.00	0	0.00
Male	0	0.00	1	0.15	0	0.00	0	0.00	0	0.00	0	0.00
Female	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Vertical Transmission	46	9.04	37	5.43	7	3.59	18	2.89	16	5.42	7	4.70
Male	30	5.89	14	2.05	3	1.54	10	1.61	9	3.05	5	3.36
Female	16	3.14	23	3.37	4	2.05	8	1.28	7	2.37	2	1.34
Unknowm	17	3.34	9	1.32	8	4.10	24	3.85	27	9.15	13	8.72
Male	14	2.75	8	1.17	7	3.59	20	3.21	24	8.14	12	8.05
Female	3	0.59	1	0.15	1	0.51	4	0.64	3	1.02	1	0.67
Total Male	424	83.30	592	86.80	176	90.26	547	87.80	250	84.75	128	85.91
Total Female	85	16.70	90	13.20	19	9.74	76	12.20	45	15.25	21	14.09
Grand Total	509	100.00	682	100.00	195	100.00	623	100.00	295	100.00	149	100.00

Source : AIDS Section, Division of Epidemiology, MOPH

Table 2.3.8 AIDS Patients by Occupation in the WSB (average % from 1989 to 1995)

	Kanchanaburi		Petchaburi		Prachuap Khirikhan		Chumphon	
	occupation	% to total patients	occupation	%	occupation	%	occupation	%
1	General worker*	51.13%	General worker*	51.66%	General worker*	42.18%	General worker*	29.63%
2	Farmer	15.28%	Farmer	11.83%	Farmer	11.64%	Farmer	24.07%
3	Unknown	7.60%	Trader	6.22%	Unknown	9.09%	Fisherman	18.05%
4	Pre-school childre	5.75%	Government Official	4.36%	Fisherman	8.00%	Pre-school childre	5.09%
5	Housewife	4.90%	Fisherman	4.15%	Shopowner	8.00%	Driver	4.17%
6	Office worker	4.39%	Pre-school children	3.11%	Pre-school children	6.55%	Trader	4.17%
7	Monk	3.03%	Monk	2.49%	Government Official	3.70%	Housewife	3.70%
8	Trader	2.57%	Unemployment	2.70%	Housewife	2.27%	Unknown	3.24%
9	Soldier	0.90%	Housewife	1.66%	Student	2.27%	Monk	2.77%
10	Prisoner	0.90%	Driver	1.66%	Prisoner	1.99%	Actor/singer	0.93%

Note : * General worker includes factory & construction workers

Source : Provincial Health Offices, May 1996

Table 2.3.9 No. of Labor Accidents in the Study Area

	1991	1992	1993	1994
Total Employed Population	n.a.	64,131	n.a.	71,619
Province				
Ratchaburi	779	837	1,508	1,613
Kanchanaburi	1,792	1,404	1,085	1,332
Samut Songkram	122	228	278	541
Petchaburi	132	361	255	380
Prachuap Khirikhan	744	558	889	252
TOTAL	3,569	3,388	4,015	4,118

Source : Regional Center of National Institute for the Improvement of Working Conditions and Environment, Ratchaburi

Table 2.3.10 No. of Labor Accidents in Factories in the Study Area

	1988	1989	1990	1991	1992	1993	1994
Fatalities	20	38	32	34	40	254	58
Permanent Total Disability		3	1	3	4	1	1
Permanent Partial Disability	119	140	153	120	356	498	464
Temporary Disability							
over 3 days	2,129	2,664	3,087	4,035	5,720	5,709	13,071
up to 3 days	3,846	4,854	5,632	7,135	10,031	10,881	11,200
TOTAL	6,114	7,699	8,905	11,327	16,151	17,343	24,794

Note : includes Nakhon Patom and Samut Sakhon provinces

Source : Regional Center of National Institute for the Improvement of Working Conditions and Environment, Ratchaburi

Table 2.3.11 No. of Factories and Workers Inspected by Labor Office in 1994

	Inspection Target		No. of Inspections		Per Cent Inspected	
Province	No. of Factories	No. of Workers	No. of Factories	No. of Workers	Factory	Worker
Ratchaburi	2,996	47,038	181	15,846	6.04	33.69
Kanchanaburi	3,296	39,899	74	7,359	2.25	26.52
Samut Songkra	1,283	9,695	111	4,528	8.65	46.7
Petchaburi	1,873	26,534	85	4,001	4.54	15.08
Prachuap Khiri	1,566	40,531	140	16,871	8.94	41.62
TOTAL	11,014	163,697	591	48,605	6.08	32.72

Source : Regional Center of National Institute for the Improvement of Working Conditions and Environment, Ratchaburi

Table 2.3.12 No. of Hospitals and Hospital Beds in 1995

Province	Public Sector						Private Sector	
	Regional Hospitals	Provincial Hospitals	Community Hospitals	Health Centers	Maternal&Child Hospitals	Military Hospitals	Hospitals with bed	Clinics
Kanchanaburi		2 (592)	11 (290)	134		1 (150)	5(221)	59
Ratchaburi	1 (669)	3 (831)	6 (190)	149	1 (162)		14(548)	85
Samut Songkram		1 (260)	2 (120)	49			2 (110)	25
Petchaburi		1 (365)	7 (150)	110		2	5 (139)	44
Prachuap Khirikhan		1 (209)	7 (290)	75			5(170)	37
Chumphon		1 (320)	10(260)	84		1	4 (174)	28

Source : Provincial Health Offices

Table 2.3.13 Health Manpower in the WSB (1995)

Province	No of Doctors	per population	Dentists	per population	Pharmacists	per population
Kanchanaburi	78	1; 9615	23	1: 32607	21	1:35713
Ratchaburi	201	1; 3804	34	1: 22491	58	1:13184
Samut Songkram	32	1; 6323	10	1: 20233	12	1:16861
Petchaburi	48	1; 9202	11	1: 40153	18	1:24538
Prachuap Khirikhan	63	1; 7050	17	1: 26126	18	1:27759
Chumphon	50	1; 8655	15	1: 28851	20	1:21639
Total in the WSB	472		110		129	
% in Thailand	2.5%		2.3%		1.3%	
Average in the WSB		1; 7441		1: 28410		1:23282
Thailand		1; 4295		1: 21561		1:12426
BKK		1; 915		1; 4182		1;2070

Source : Provincial Health Offices

Table 2.3.14 No of Beds in Private Hospital in the Study Area (1995)

	No of Beds in Public Hospitals	No of Beds in rivate Hospitals	Total No of Beds	% of Private
Kanchanaburi	1016	221	1237	17.80%
Ratchaburi	1852	548	2400	22.83%
Samut Songkram	380	110	490	22.40%
Petchaburi	515	139	654	21.20%
Prachuap Khirikhan	499	170	669	25.41%
Chumphon	580	174	754	23.00%
Total(Average) in W	4,842	1,362	6,204	21.95%

Source : Provincial Health Offices, Ministry of Public Health

Figure 2.1.1 Household Expenditures in WSB

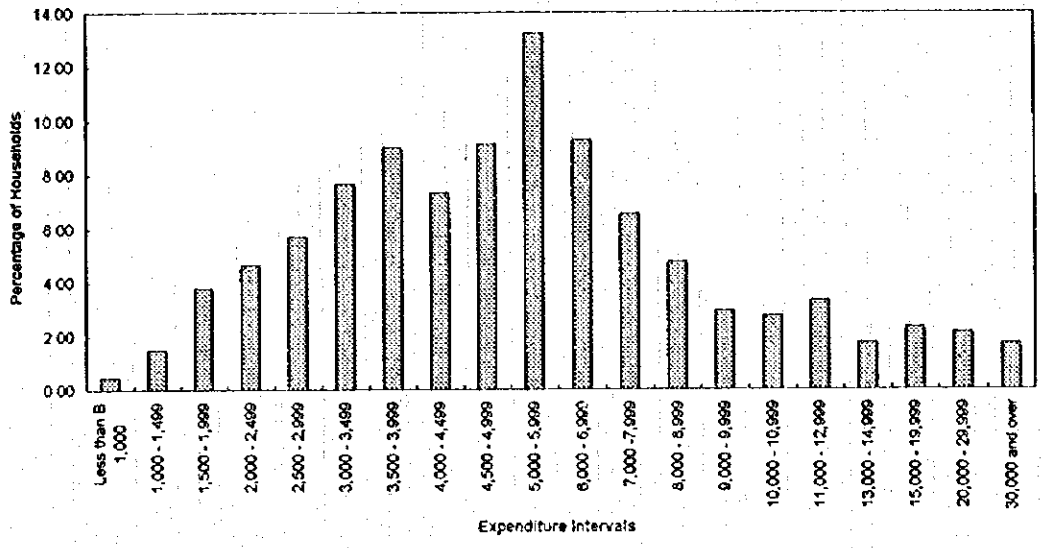
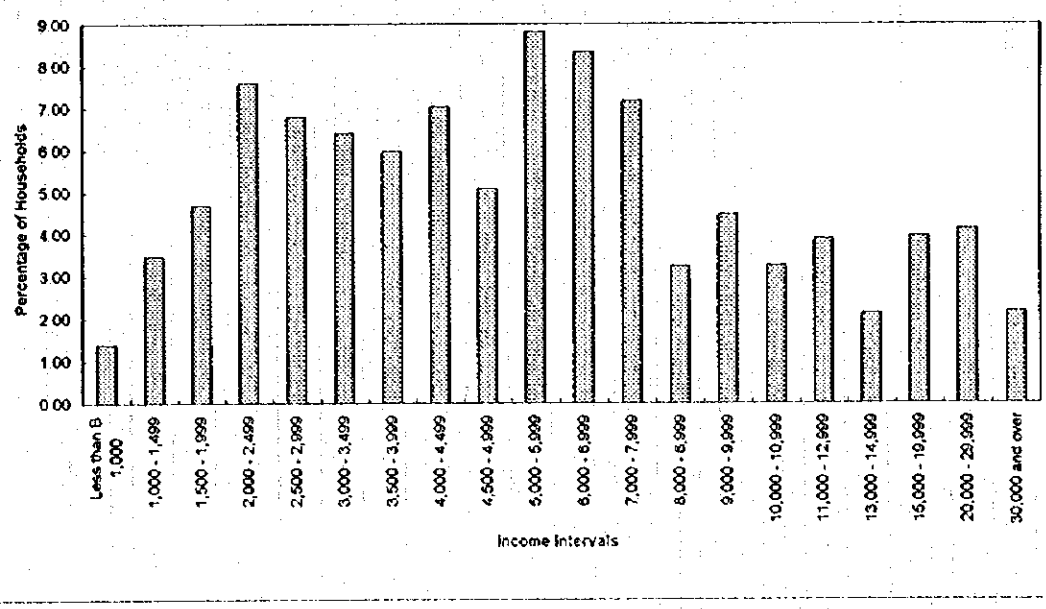


Figure 2.1.2 Household Income in WSB



APPENDIX I

The Household Perception Survey

APPENDIX I

QUESTIONNAIRE FOR VIEWS ON QUALITY OF LIFE IN THE WESTERN SEABOARD

Identifiers: Date of Interview 17-28 June 1996
Respondent Name:_____
Changwat_____
Amphoe_____
_____Rural _____Urban
Respondent's Gender 70 (57.4%) Male 52 (42.6%) Female
Age at Last Birthday_____ Number of Years of School Completed_____
Has respondent ever taken any vocational education courses? 31 (25.4%) Yes 91 (74.6%) No
Any other special training? 56 (45.9%)Yes 66 (54.1%) No For how many months?____

Main Activity: 1 Housewife 8 Teaching 3 Nurses 1 Medical Doctor 4 Public Health Worker 7 Student 6 Study and Part-time work 1 Local Administration 11 Local Administration and Business 6 Civil Servants (police, clerks) 7 Civil Servant and Family Business 6 Civil Servant and Agriculture 15 Business, Commerce 6 Private Business Employee 11 Laborer and Casual Work 18 Farmer 5 Fishing 2 Not in Labor Force (Too old, retired) 4 Monk

Employed: 38 (31%) Self-employed
29 (23.8%) Self-employed and salaried worker
24 (19.7%) Salaried worker
12 (9.8%) Casual worker
6 (4.9%) Part-time worker (student)

Unemployed: 7 (5.7%) Student
4 (3.2%) Monk

Not in Labor Force: 2 (1.6%)

Does respondent appear to be well off? (Interviewer should look at respondent's housing, clothes) 17 (13.9%) Poor 76 (62.3%) Middle 29 (23.8%) Wealthy

Views on Area (Amphoe, Province, Neighborhood)

1. All things considered, how would you rate the quality of life in the area where you now live (on a scale of 1-10, with 1=poor, 10=excellent)?

8.41 Availability of food
7.67 Availability of housing
7.91 Neighbors
7.79 Natural beauty of area
7.98 Proximity to family and friends
8.04 Convenience to work
8.55 Convenience to shopping
7.74 Cultural atmosphere
7.13 Religious environment
7.92 Family values in the area
7.48 Availability of income opportunities

2. What are the features you most like about where you live? (Number of responses = 213, as some respondents listed more than one positive feature):

84 (39.4%) Environment, natural beauty
54 (25.4%) Cooperativeness and sincerity of residents
21 (9.9%) Reasonable cost of living
14 (6.6%) Good public utilities
12 (5.6%) Convenience to work
11 (5.2%) Tourist area
5 (2.4%) Accessibility to social amenities
4 (1.9%) Housing availability
4 (1.9%) Security of area
3 (1.4%) Good area for family life
1 (0.5%) Cultural aspects

3. And what would be the things you *least* like about the area in which you live? (Number of responses = 182, as some listed more than one feature):

52 (28.6%) Crime/prostitution/drugs
32 (17.6%) Lack of public utilities
27 (14.8%) Pollution
21 (11.5%) Unsavory characters in area (gamblers, insincere)
17 (9.3%) Poor Government services
10 (5.5%) Lack of amenities
8 (4.4%) Presence of immigrants
7 (3.8%) Congestion
7 (3.8%) Presence of gangsters
1 (0.5%) Presence of AIDs

4. Have there been any significant changes in your area in, say, the last five years? 118 (96.7%)Yes 4 (3.3%) No.

Significant changes (N = 229 due to multiple responses)

78 (34.1%) Improved public utilities (roads, electricity, water)
33 (14.4%) Housing availability
23 (10.0%) Availability of tourism facilities (hotels, resorts, golf courses, etc.)
23 (10.0%) Improved economic conditions (jobs, incomes)
13 (5.7%) Rising land values
12 (5.2%) Increase in job-seeking immigrants
11 (4.8%) Increase in number of factories in area
10 (4.4%) Increased congestion
6 (2.6%) Increase in shopping malls
5 (2.2%) Increase in schools and playgrounds
4 (1.8%) Increase in health problems (AIDs, drug utilization)
4 (1.8%) Improved cooperation, honesty of neighbors
3 (1.3%) Better services from Government officers
3 (1.3%) Environmental degredation
1 (0.4%) Erosion of family values

5. Are there any changes which you would *like* to see which have not yet taken place? (N=216 due to multiple responses)

52 (24.1%) Improved public utilities
32 (14.8%) More schools and institutions for higher learning
31 (14.4%) More factories so people can work
24 (11.1%) Need to reduce pollution

17 (7.9%) Need more jobs
12 (5.6%) Needed improvements in morality
11 (5.1%) Need to become tourist center
10 (4.6%) Better security and elimination of drug utilization
8 (3.7%) Current conditions satisfactory, don't need more change
8 (3.7%) Need more shopping centers
7 (3.2%) Need improved Government services
2 (0.9%) Need to maintain family values
1 (0.5%) Need occupational training
1 (0.5%) Need to reduce congestion

6. Do you expect to stay in this same area for, say, another 10 years or more?

94 (77.1%) Yes
13 (10.7%) Not sure
15 (12.3%) No Why not?
6 (4.9%)Expect to move to get better job
3 (2.5%) Expect to return to home area
6 (4.9%) Expect to move in with children

Views of Neighbors:

7. Now, I would like to hear about your views of your neighbors. How do you get along with your neighbors?

A. Positive Views about Neighbors (n = 112, = 100%)
41 (36.6%) Neighbors helpful, can be counted on for assistance
30 (26.8%) Neighbors friendly
24 (21.4%) Neighbors dependable, friendly, and religious
7 (6.3%) Friendly, rather like me
10 (8.9%) Friendly, religious, reliable

B. Negative Views about Neighbors (n = 10, = 100%)
4 (40%) Neighbors mind their own business, keep to themselves
3 (30%) Don't know each other, not helpful
2 (20%) Neighbors are selfish
1 (10%) Neighbors steal

8. If you needed help, do you think you could count on your neighbors?
10 (8.2%) No
112 (91.8%) Yes

9. How would you say you get along with your neighbors in comparison with 5 years ago?
27 (22.1%) Better
82 (67.2%) Same
13 (10.7%) Worse

10. How would you describe the younger people in the area?

48 (39.3%) Well-behaved
41 (33.6%) Addicted to drugs or amphetamines
27 (22.1%) Most well-behaved, but some troublesome
3 (2.5%) Disobedient
3 (2.5%) Don't know, no opinion

Views on Possible Improvements to Area

11. How do you think your area might be improved? (N=230)

82 (35.7%) Public utilities (roads, no black-outs, clean/potable water
33 (14.4%) More schools & institutions of higher learning
28 (12.2%) Local administration
21 (9.1%) Environmental protection (garbage, water, and forests)
16 (7.0%) More factories for job opportunities
13 (5.7%) Get rid of crime and drugs
11 (4.8%) Present situation is quite all right
10 (4.3%) Need to improve morality
10 (4.3%) Occupational training
3 (1.3%) Government services
3 (1.3%) Cut off migration to this area

12. If you wanted to improve the quality of your life, what would you improve first? (N=148, due to multiple responses)

56 (37.8%) Income
26 (17.8% Education, professional courses
15 (10.1%) Housing
12 (8.1%) Employment
9 (6.1%) Family
7 (4.7%) Personality
2 (1.4%) Neighbors
3 (2.0%) Personal health
1 (0.7%) Need to move to find better job
9 (6.1%) Present situation is quite all right
8 (5.4%) No response

13. Would you say that the elderly are well-cared for in the area?

3 (2.5%) No
3 (2.5%) Not so well
116 (45.1%) Yes By whom?

106 (91.4%) Family
7 (6.0%) Neighbors
3 (2.6%) Not specified

14. Have you ever heard of a Regional Plan for the Western Seaboard?

96 (78.7%) No
26 (21.3%) Yes

Political Participation:

15. Are you aware of recent local elections (e.g., Tambon Council)?

27 (22.1%) No
95 (77.9%) Yes

16. Did you participate in local elections? How?

54 (56.8%) Did not participate
33 (34.8%) Did not wish to participate

21 (22.1%) No elections in the area

40 (42.1%) Participated
5 (5.3%) Participated as candidate
32 (33.7%) Voted
3 (3.2%) Served on committees
1 (1.1%) No response

17. Do you care about local politics?
36 (29.5%) Do not care
86 (70.5%) Care

18. Views on local administrators. Do you consider your local officials to be competent? Honest? Effective? Helpful? What if you had a problem. Could your local officials be counted on to try to help you resolve it?

10 (8.2%) Don't know
36 (29.5%) Hold negative views
73 (59.8%) Hold generally positive views
3 (2.5%) Leaders helpful but not very effective

19. Is there anything in particular you would like to see changed in terms of local administration? (N=137 due to multiple responses)

53 (38.7%) No comment
26 (19.0%) Improve the administrative process
21 (15.3%) Improve the fiscal process
14 (10.2%) Prevent vote buying
9 (6.6%) Let people participate in decision-making process
5 (3.7%) Increase educational requirement for candidates
4 (2.9%) Raise voting age above 18 years
3 (2.2%) Extend terms of local leaders from 4 to 7 years
2 (1.5%) Election committee should be neutral

20. How about national-level politics? Are you interested in national politics or not?

50 (41.0%) Not interested
72 (59.0%) Interested

21. Do you mostly shop locally or do you go outside your local area for your shopping needs?

A. Household Consumption

53 (43.4%) In local district
37 (30.3%) In local village
20 (16.4%) In town center
5 (4.1%) Anywhere, does not matter
4 (3.3%) Shop in big cities (Bangkok or other urban areas)
3 (2.5%) No response

B. Housewares

55 (45.1%) In local district
48 (39.3%) In town center
13 (10.7%) In local village
3 (2.5%) Shop in big city (Bangkok or other urban areas)

3 (2.5% Anywhere, does not matter

C. Hardware & Equipment

52 (42.6%) In local district
44 (36.1%) In town center
15 (12.3%) Shop in big city (Bangkok or other urban areas)
8 (6.6%) In local village
2 (1.6%) Anywhere, does not matter
1 (0.8%) No response

22. Do you care about the brand names of the products you buy?

44 (36.1%) Buy any brand that is up to date
39 (32.0%) Care about brand names
24 (19.7%) Care mostly about price
11 (9.0%) Care about quality and price
4 (3.3%) No response

23. If you needed credit, where would you borrow?

14 (11.5%) Never think of borrowing
108 (88.5%) If borrowed, would borrow from:

50 (41.0%) Commercial bank
20 (16.4%) Relatives
18 (14.8%) Other creditor
12 (9.8%) Cooperative
5 (4.1%) Would take from personal savings
3 (2.5%) Government fund

24. Do you have any views of the Burmese in your area? (N=126)

40 (32.8%) Negative views:
17 (13.9%) Cannot be trusted; cannot communicate
23 (18.9%) They are illegal workers

15 (12.3%) Neutral views (Don't mind them)

67 (54.9%) Positive views:
39 (52.0%) Cheap labor, hard working, diligent
24 (19.7%) Necessary, because of labor scarcity

4 (3.3%) No response

Social Concerns for the Foreseeable Future (next 10 years):

25. What are your concerns about the future? (N=268 due to multiple responses)

57 (21.3%) Erosion of environment, pollution
45 (16.8%) Inflation, high cost of living
29 (10.8%) Population congestion
28 (10.5%) Rising land prices
21 (7.8%) Crime and prostitution
17 (6.3%) Poor health, sickness, accident, AIDs
17 (6.3%) Erosion of family values

14 (5.2%) That I won't be able to earn enough
13 (4.9%) Social conflicts
11 (4.1%) Industrial development
8 (3.0%) Out-migration for job opportunities
5 (1.9%) Migrant labor
2 (0.7%) Labor shortage
1 (0.4%) Unemployment

APPENDIX II

Evaluation Design For Monitoring Social Development In The Western Seaboard

APPENDIX II

EVALUATION DESIGN

Objective

In attempting to set out an evaluation design for the various investment components proposed in other sections of the WSB Master Plan , it is necessary to clarify first, what is to be evaluated, and second, in what terms. Development has both macro- and micro-implications, and both economic and social dimensions. Clearly, the investments proposed in the Master Plan can be expected to increase Gross Regional Product (and per capita GRP), the demand for labor, wages, and other labor market components, but these, in turn, will likely impact on such social indicators as birth rates, migration, relations among family members, and political aspirations. For analytical purposes, many of these macro consequences must be deduced from micro considerations, so that convention requires disaggregation of macro effects into more manageable micro components.

Macro effects are merely the aggregation of impacts across individuals, families, institutions, systems, or provinces. Micro-effects are defined in terms of direct effects of individual investment projects proposed elsewhere in the Master Plan. Thus, the creation of an industrial estate will generate jobs and incomes in the immediate area in which it is located (micro-effect) and this, in turn, may lead to urbanization, congestion, pollution, weakening of family ties, and an increase in the Government budget devoted to social services (macro-effects).

For purposes of this evaluation design, macro effects will be subject to periodic monitoring over time, while micro (investment) impacts will be subject to more systematic measurement with an experimental design, comparing specified dependent variables (say, air pollution, wages, or incomes) between "treatment" and control groups.

Monitoring Macro Effects

The proposed monitoring system will generally follow procedures indicated in the main body of the text of this Volume. Both objective (secondary) and subjective (primary) data

will be assessed over time. To permit this, baseline data must be collected on a variety of variables:

Population growth
(fertility, fecundity,
number of still and
live births, migrants)

Labor force participation rates
(by age, sex, relation to family
head, education, etc.)

Labor market operations
(rates of employment,
unemployment, hours of work,
productivity, wage rates, absenteeism,
labor turnover, job vacancies)

Availability of services:
(education/training, health,
support services, transportation,
housing, municipal services)

Effectiveness of services
(birth weights, student test scores,
average time to get to work,
shopping, gross vs. net incomes,
number of homeless)

The income distribution
(poverty, average incomes,
relative incomes, consumption)

The above indicators can be analyzed with secondary data, some of which (such as income and expenditure data) are already being collected as a matter of course by national or provincial authorities. Other data are not now being collected but could be with very little difficulty -- e.g., birth weights of new-born infants, or test scores of students. However, some indicators would require special samples, of the sort mentioned in the main text of this volume: employer views on the productivity of new hires, individual views on quality of life, social concerns, and aspirations. For these indicators, the questionnaire listed in the Appendix I would provide a useful starting point. It would, however, require modification over time; for example, the questionnaire begins with respondent rankings of their residential areas. It will doubtless be necessary to ask similar questions on respondent rankings of the quality of their lives over time.

For these perception (opinion) surveys, an expansion in sample size (relative to that discussed in Appendix I) will be necessary. Twenty respondents per province is likely too small to permit generalizations of the type desired. Rather than a sample size of 120, a total of 500 respondents would be preferable, in order to permit a series of cross-tabulations to be generated: incomes of female-headed or rural families, respondent views on the effectiveness of local administrators by low- versus high-income families,

etc. For certain questions, it might be possible to link into ongoing surveys, such as that on the labor force, or income and expenditures.

A very important potential source of information is local administrators: physicians, teachers, police officials, NGO officials, etc. These officials are generally well apprised of special problems in their fields of cognizance. For example, provincial health officials interviewed as reported in the main text, pointed out a growing problem of infectious diseases being transmitted by illegal migrants, as well as deteriorating air quality in the Bang Saphan area.

Periodicity is an important consideration for monitoring activities. Ideally, opinion (perception) data would be collected annually, as would be data on such social indicators as health and municipal services. The Labor Force Survey is now being carried out at the provincial level three time per year. These data, however, will have to be supplemented with direct interviews with employers to determine their views on the quality of their workers, training needs, etc. The Income and Expenditure Survey is carried out every two years which should be sufficient for monitoring purposes. There are significant lags (currently about two years) in processing these survey data, however, so special funding might have to be sought to speed up the work of the National Statistical Office.

Likely Sources of Bias

Standard interview surveys will likely fail to reflect the circumstances of illegal migrants and, perhaps, the informal sector[1]. Data derived from hospitals on birth rates, for example, will not cover the situation of many mothers who prefer midwives to hospitals. This may not be a particular problem when the intention is to reflect the situation of local Thais during the development process, but for other purposes, the exclusion of illegal migrants may be more serious. In these cases, special-purpose surveys may be required, and it might be necessary to recruit enumerators from the ranks of those whose responses are desired. For example, surveys of crime among young people are likely best carried out by youthful offenders, and surveys of illegal migrants are probably more accurate when the enumerator is an illegal migrant.

[1]Theoretically, household surveys should reflect earnings from the informal sector, but there may be problems of recall which limit the accuracy of data from this source.

Measuring the Effects of Industrial Investments

In addition to the general monitoring of social progress during accelerated economic development, it will often be desired to measure the costs and benefits of particular project investments. In these cases, some sort of control group will be required; that is, a group which is not subject to the treatment effect to be measured. In some cases, control groups can be drawn from provinces in which no investment of the sort to be analyzed have been made; in others, controls can be drawn from individuals (in the same province) who have not been deemed eligible for the treatment.

For example, suppose it is desired to measure the impact of a secondary science school on individual earnings. If entrance probabilities to the new school were completely random (i.e., all primary school graduates in the province where the school was located had equal opportunity to gain admission) *and* chances of successful completion of courses were also randomly distributed, then one could simply compare the future earnings stream of graduates with other secondary school graduates to discern the impact of the special school. As such probabilities are not equally or randomly distributed, some special adjustments will be required.

One possible procedure would be to test primary school graduates in a nearby province, and then to select those whose test results are comparable to those of students admitted to the secondary school. This would control for the "entrance effect". However, it is known that students tend to respond to rewards, so that students in better schools are likely to progress more rapidly than students in less well-financed schools. This implies the need for recurrent testing during secondary school years, with comparisons restricted to students with roughly equal scores at the completion of secondary school. Even here, bias remains a strong possibility, so further correction for "selectivity bias"[2] may be required. A potentially fruitful (but expensive) alternative would be to provide IQ tests to a large group of students and then to restrict comparisons over time to those who attended the special secondary school and those with similar IQs.

Finding appropriate control groups against which to measure the impact of physical investments, such as industrial parks, may be yet more complicated. Here, simple

[2]See James Heckman, "The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models," *Annals of Economic and Social Measurement*, Volume 68, 1976.

"before and after" comparisons are easiest, but given the length of time for such investments to come to fruition and the fact that the economic environment may be changing rapidly, it is really very difficult to disentangle the effects of investments with any degree of precision. Unless authorities are willing to invest a good deal of money in project evaluation, simple monitoring of the sort mentioned above may have to suffice. Even in these cases, however, the use of control groups (such as neighboring provinces) remains a good idea. It is not particularly costly and can provide a benchmark against which to measure changing indicators.

APPENDIX III

PROFILE OF PROPOSED PROJECTS/PROGRAMS

Project No. SS 1

1 PROJECT TITLE	Social Monitoring and Evaluation
2. LOCATION	WSB as a whole
3. AGENCY	NESDB
4.OBJECTIVES	(1) to maximize social benefits and minimize social costs associated with the WSB development through regular and institutionalized monitoring and evaluation of various social changes, and (2) to motivate local people to become actors of the development through their participation in monitoring and evaluation activities.
5. PHASING	Phase I for design and initial establishment of the monitoring and evaluation system; Full implementation from Phase II

6. DESCRIPTION

The WSB Master Plan adopts a holistic approach to social and human development. The holistic approach is to implement various measures selectively and with caution, while monitoring their effects and constantly adjusting the implementation. This is a valid approach when significant social changes are expected as the WSB development proceeds. It is also in line with the new development paradigm advocated by the Eighth Plan and the Thailand Vision 2020.

The following may be subject to monitoring and evaluation :

- Social environment in general and changing social values (the family, child-rearing and parental control, social deviancy such as crime or alcoholism, relations among neighbors, political participation, participation in cultural or community events, etc.) ;
- Quality of life (culture, amenities, respondent rankings of the quality of life within their areas) ;
- Patterns of migration ; and
- Changing social indicators: health, housing, education and training, income distribution, social services, access to the legal system, political participation, relations with local administrators.

7. RELATION WITH OTHER PROJECTS	SS2 (Local Governance System Improvement)
8. COST (Approx.)	Phase I = $1 million Phase I = $2 million Phase I = $2 million

Project No. SS 2

1. PROJECT TITLE	Local Governance System Improvement
2. LOCATION	All the WSB provinces
3. AGENCY	Ministry of Interior and Local governments
4.OBJECTIVES	(1) to improve channels of communication between local residents and government officials, and (2) to begin implementing "bottom-up" approach to local governance.
5. PHASING	Phase I for improvement of provincial governance and strengthening of TAOs; further decentralization subsequently

6. DESCRIPTION

The existing local governance system needs to be improved to achieve more effective social and rural development. General directions for such improvement should be based on (1)further decentralization of development administration, and (2) newly instituted status of Tambon Administrative Organization.

At the provincial level, development budgeting should be changed from the present control oriented system into a planning oriented one by adopting the PPBS. A prerequisite is to transform the provincial investment plans just prepared into a real provincial development plan in line with the WSB Master Plan through intensive communication/consultation at the province level based on the two basic documents.

At the tambon level, more Tambon Councils will be incorporated into the local administration, and local participation institutionalized with TAOs. This would strengthen a bottom-up planning mechanism.

7. RELATION WITH OTHER PROJECT	SS 1 (Social Monitoring and Evaluation)	
8. COST (Approx.)	Phase I =	$2 million as start-up cost

Project No. SS 3

1. PROJECT TITLE	Social Partnership Promotion
2. LOCATION	All the WSB provinces
3. AGENCY	Private sector and BOI
4.OBJECTIVES	(1) to encourage private business and individuals to participate in the provision of some social services or amenities, or to support socio-cultural activities; and (2) to realize lively communities with amenities to attract more investments.
5. PHASING	Phase I for initiation; to be continued as long as judged necessary

6. DESCRIPTION

The WSB development would be supported, among others, by more substantive roles of the private sector in all phases of development and more active participation of local people. This strategy applies particularly to socially-oriented and human-centered development.

Roles for the private business and residents in the provision of broad social services should be expanded at the local level. This may be accomplished through citizen oversight boards (e.g. for environmental protection), direct private sector contributions (e.g. for establishment and operation of schools and hospitals), and sub-contracting from the Government to local services providers or to NGOs. Private business may "adopt" a local community for the provision of various social services with additional incentives provided by the Government such as tax rebates.

7. RELATION WITH OTHER PROJECT	SS 1 (Social Monitoring and Evaluation)
8. COST (Approx.)	Phase I = $1 million

Project No. ED 1

1. PROJECT TITLE	Experimental Schools and Curriculum Revision
2. LOCATION	All the WSB provinces
3. AGENCY	Private sector and Ministry of Education
4.OBJECTIVES	(1) to increase transition from elementary to secondary schools ; (2) to upgrade the teaching of science and technology at the secondary level ; and (3) to reduce the outmigration of students who now seek secondary schooling in Bangkok or other urban areas.
5. PHASING	Phase I for designation of experimental schools, curriculum revision, and planning for facilities improvement; Phase II for implementation

6. DESCRIPTION

To establish a precedent of socially oriented and human centered development advocated by the Eighth Plan and Thailand Vision 2020, the reforms in the education sector currently under discussion at the national level should be introduced first in the WSB region. In particular, experimental schools should be established either newly or capitalizing on existing schools and curriculum revision undertaken with emphasis on science and engineering.

Two secondary schools may be designated initially in the WSB as the drop-out problem starts at this level. The schools may be operated as non-profit institutions, with fees from students but scholarships for the needy. The schools would select students on the basis of entrance examinations and would have residential facilities. Computer literacy would be expected of all students and encouraged by significant computer availability.

7. RELATION WITH OTHER PROJECTS	ED 2 (High-technology Universities) ED 4 (Computer Availability Expansion)	
8. COST (Approx.)	Phase I =	$1 million
	Phase II =	$10 million

Project No. ED 2

1. PROJECT TITLE	High-technology Universities
2. LOCATION	Petchaburi province
3. AGENCY	Private sector and Ministry of University Affairs
4.OBJECTIVES	(1) to expand the availability of university education, thereby reducing pressures for outmigration from the WSB; (2) to establish and enhance the image of the WSB for specialized and advanced education; and (3) to expand the availability of science and management graduates.
5. PHASING	Phase I for designation of universities, legislative measures, and planning for facilities, followed by initial implementation

6. DESCRIPTION

According to its vision, the WSB region will be characterized, among others, by some specialized social services and amenities for various people of different backgrounds including immigrants. One of the specialized social services expected in the WSB is advanced education. More important fields include science and technology to support high-technology industrialization and hotel management to support tourism development as well as overall development management.

Two universities may be designated initially in the WSB. One of them may be the existing Rajabhat Institute, Petchaburi with a hotel administration program. Legislative measures need to be taken to develop it into full university status. Another university may be designated in relation to the proposed Science City for science and technology development.

7. RELATION WITH OTHER PROJECTS	UD 2 (Specific City, Petchaburi) TO 2 (Tourism-related Improvements)
8. COST (Approx.)	Phase I = $5 million Phase II = $10 million

Project No. ED 3

1. PROJECT TITLE	Industry-based Training Center
2. LOCATION	In or near any of the industrial estates in the WSB
3. AGENCY	Ministry of Labor and Social Welfare and the private sector
4.OBJECTIVES	(1) to encourage skills development with private sector initiative; and (2) to expand and enhance human capital to support the WSB industrial development.
5. PHASING	Phase I for the establishment of a center as a demonstration project

6. DESCRIPTION

Skills training holds a key for the accelerated industrialization envisioned by the WSB Master Plan. Since on-the-job training would be more effective for market responsive skills training, the Government should support such efforts by private firms.

To elicit private sector initiative, a training facility would be established in or around any of the industrial estates planned by the WSB Master Plan. Training plans should be prepared jointly by the Government and employers. The Skills Development Fund would be utilized to reimburse training costs for employers whose workers passed a generally agreed competency-based examination. The employers take responsibilities for organization and provision of training.

7. RELATION WITH OTHER PROJECTS	ID 3 (Industrial Core and Satellite) TR 1 (Free Trade Areas)
8. COST (Approx.)	Phase I = $5 million

Project No. ED 4

1. PROJECT TITLE	Computer Availability Expansion
2. LOCATION	Rural areas in the WSB
3. AGENCY	Local governments, and Communications Authority of Thailand
4.OBJECTIVES	(1) to improve access to vital information in rural areas; and (2) to prepare the rural populace for the forthcoming information age.
5. PHASING	Phase I for design of information network for a specific purpose; stepwise expansion in subsequent phases

6. DESCRIPTION

Most rural areas in the WSB are handicapped by limited access to vital information related to availability of various social services, education and training opportunities, marketing and others. Computer availability and use are also limited in rural areas. To prepare for the forthcoming information age with computer-based information exchange and Internet linkages, certain steps need to be taken in the nearest future.

First, computer availability should be expanded in schools, hospitals, local temples, public libraries and other public facilities. Second, computer literacy should be expanded among local people. Local manufacturing of personal computers and involvement of industries in computer training would be instrumental for these. Eventually, fiber-optic cables would be installed and linked to satellite transmissions.

7. RELATION WITH OTHER PROJECTS	ED 1 (Experimental Schools) TL 6 (Information Highway for Education)
8. COST (Approx.)	Phase I = $2 million Phase II = $5 million

Project No. PH1

1. PROJECT TITLE	Medical Research Laboratory with Hospital
2. LOCATION	Petchaburi province (central facilities within Science City)
3. AGENCY	Private sector, and Ministry of Public Health
4. OBJECTIVES	(1) to upgrade medical research capability and medical technology within the WSB, (2) to enhance laboratory capability in the WSB, and (3) to contribute to better health conditions for residents of Petchaburi and Prachuap Khirikhan with in-patient facilities.
5. PHASING	Phase I for establishment of health research network and planning for advanced facilities to be additionally provided in the WSB; Phase II for the provision of additional facilities

6. DESCRIPTION

The WSB region at present has adequate health facilities compared with the average availability at national level, but faces shortages in health personnel. Therefore how to attract qualified health personnel is a key issue in the health sector. Also, as the WSB regional development proceeds, needs will increase for more advanced medical treatment and medical technology to deal with complex syndromes.

This project aims at upgrading medical research capability and medical technology within the WSB to promote the health conditions of residents with a long term view. First, a network of health research would be established linking existing medical and research facilities in the WSB, and the BMA, and needs for advanced facilities to be additionally provided in the WSB clarified during Phase I. Of the additional facilities, central ones would be established within the proposed Science City in Petchaburi during Phase II. The health research network may be extended to link even with facilities in other countries.

7. RELATION WITH OTHER PROJECTS	UD 2 (Specific City, Petchaburi)
8. COST (Approx.)	Phase I = $20 million

Project No. PH 2

1. PROJECT TITLE	Regional Occupational Health Center
2. LOCATION	Bang Saphan, Prachuap Khirikhan province
3.AGENCY	Ministry of Labor, and Ministry of Public Health
4.OBJECTIVES	(1) to establish better working conditions in the region, (2) to provide treatment for occupational injuries and diseases by occupational doctors, (3) to disseminate necessary information to protect workers from industrial accidents and occupational diseases, and (4) to implement effective labor inspection related to industrial safety and health.
5.PHASING	Phase I to Phase III

6.DESCRIPTION

The risk of workers getting involved in labor accidents or occupational diseases will rapidly increase with industrialization in the WSB. However, neither employers nor employees have recognized the necessity to control the risk. The promotion of industrial safety, and industrial health control through training, publication and display of safety in industrial estates will benefit enterprises by improving their productivity. Occupational doctors and nurses who have practical knowledge can provide adequate first aid for injuries and diseases. Strengthening of safety inspection by labor inspectors, strengthening of public relations, and research for major industrial hazards are also activities of the center.

7. RELATION WITH OTHER PROJECTS	ID 3 (Industrial Core and Satellite) TR 1 (Free Trade Area, Bang Saphan) TL 4 (Medical Information System)
8. COST (Approx.)	Phase I = $2 million Phase II = $4 million Phase III = $4 million

Project No. PH3

1. PROJECT TITLE	Emergency Medical Service Upgrading
2. LOCATIONS	Public Hospitals in All Areas
3.AGENCY	Ministry of Public Health
4.OBJECTIVES	(1) to upgrade equipment both in the emergency room and ambulance of each hospital, (2) to improve the emergency medical system utilizing local transportation and telecommunication network, and (3) to implement training for health personnel to cope with occupational injuries and hazard through first aid.
5. PHASING	Phase I to Phase II

6. DESCRIPTION

Traffic accidents are among the three leading causes of death in the WSB. The mortality rate per population is especially high in Prachuap Khirikhan and Chumphon, provinces along Route 4, because a majority of accidents occurs on highways. The number of fatalities from traffic accidents is expected to increase with rapid motorization, but emergency medical services are not sufficient. Upgrading of medical equipment is necessary for both emergency rooms and ambulances.

Ambulances in each public hospital have been used mainly for the transportation of the injured to a larger hospital in the region or special hospitals in Bangkok. Thus improvement of emergency medical services utilizing an improved transportation and telecommunications network would be desirable in order to transport the wounded to the nearby hospital as quick as possible.

Also, training for providing adequate treatment of occupational hazard such as chemical explosions and poisoning is necessary as the number of occupational injuries has been increasing in the WSB.

7. RELATION WITH OTHER PROJECTS	RT 3 (Road Safety)	
8. COST (Approx.)	Phase I =	$2 million
	Phase II =	$3 million

Project No. PH4

1. PROJECT TITLE — Integrated HIV/AIDS Control

2. LOCATION — All areas

3. AGENCY — To be operated jointly between Ministry of Public Health, Provincial Health Offices, and non-profit organizations (Universities, NGOs)

4. OBJECTIVES — (1) to provide more effective health education to prevent HIV infection especially in high risk groups, and
(2) to implement community-based care for AIDS patients.

5. PHASING — Phase I

6. DESCRIPTION

The Study Area is one of the most critical regions in the HIV epidemic, where infectious levels of HIV among prostitutes, male STD patients, and pregnant women are much higher than the country medians. Despite the nation-wide campaign against AIDS, the number of AIDS cases is expected to increase in the WSB due partly to a large number of poorly educated in-migrants. Also, very few measures for treatment of AIDS patients have been taken as the national campaign has focused mainly on prevention. Due to the limited number of hospital beds, community-based care should be promoted.

This integrated HIV/AIDS control project includes following:

(i) health education for high-risk occupational groups such as factory workers, fishermen, and truck drivers in cooperation with industries and associations,
(ii) health education for foreign workers (e.g., from Myanmar) in their languages,
(iii) a mass media campaign to change sexual behavior of residents including migrants, and
(iv) training of home-based care for district-level health personnel and village health volunteers.

7. RELATION WITH OTHER PROJECTS

8. COST (Approx.) — Phase I = $5 million

Project No. PH5

1. PROJECT TITLE Health Promotion Upgrading

2. LOCATION All areas

3. AGENCY Ministry of Public Health, and Provincial Health Offices

4. OBJECTIVES
(1) to increase health awareness of people, thereby improving health behavior,
(2) to enhance self-care and community-based care through community participation, and
(3) to support the people and non-governmental organizations in health development .

5. PHASING Phase I

6. DESCRIPTION

Health development must encourage people's participation so that they can solve health problems by themselves. Although the Government has implemented many health education programs, problems such as high prevalence of diarrhea due to inadequate food practices are still significant. Community participation is limited because of difficulties in disseminating experiences of model implementation.

Health promotion programs should be upgraded to empower people's self-reliance utilizing the local knowledge such as traditional medical care, herbal drugs, community participation on consumer protection, and environmental preservation. Several programs would be prepared for different age groups for maternal and child health, school health, and elderly care. Involvement of NGOs may be useful. Since health promotion programs must be relevant to local needs, evaluation of existing projects in each province is necessary.

7. RELATION WITH OTHER PROJECTS

8. COST (Approx.) Phase I = $1 million