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Approaches to the development of environmental education for Thailand

Jira Jintanugool

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To the Graduate Council:

I am submitting herewith a thesis written by Jira Jintanugool entitled "Approaches to the development of environmental education for Thailand." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Forestry.

David M. Ostermeier, Major Professor

We have read this thesis and recommend its acceptance:

Thomas H. Ripley, Kerry F. Schell, Brady J. Deaton

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

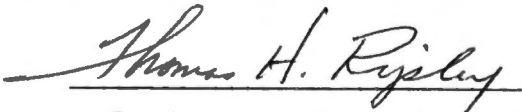
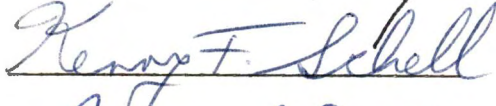
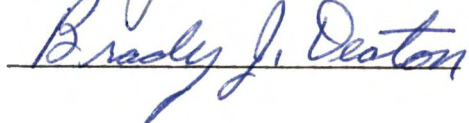
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David M. Ostermeier, Major Professor

We have read this thesis and recommend its acceptance:

Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

APPROACHES TO THE DEVELOPMENT
OF ENVIRONMENTAL EDUCATION
FOR THAILAND

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee

Jira Jintanugool

March 1975

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ABSTRACT

Environmental problems have increased in number and intensity in Thailand during the last few years. The explosion of the country's population has been the primary factor that has caused several environmental problems. A related problem has been the misuse of natural resources which has directly affected environmental deterioration. Acceleration of the nation's developing economy has resulted in increasing environmental problems. It is felt that environmental education would be an effective method to help ease environmental problems.

It was the purpose of this study to develop some generalized approaches to environmental education which can be effectively used as a guide in developing environmental education programs in Thailand. In order to develop these approaches, it was also necessary to examine major components of environmental education in Thailand.

Two principal components of environmental education were examined. The socioeconomic setting in Thailand was the first component analyzed and included an examination of the people, the economy, and educational system. The other component examined was resource development, in which forestry, agricultural, land, and rural development, were identified.

Some general concepts and philosophies of environmental education which have been widely accepted in the United States were reviewed.

This was followed by sets of suggested approaches in development of environmental education for Thailand. The approaches were distinguished into two major areas, school-oriented educational and nonschool educational approach. The school-oriented educational approach was concerned with formal and informal education within school. The nonschool educational approach emphasized the role of the Royal Forest Department in preparing study areas as well as other services and facilities in supporting environmental education in Thailand.

Major recommendations of the study were: (1) Implement environmental education in Thailand's school systems; (2) Establish an in-service teacher training program; (3) Provide interpretive services; and (4) Consider further study and research.

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CHAPTER I

INTRODUCTION

Global environmental problems have been increasing in number and intensity in recent years. Related terms such as ecological crisis or pollution are frequently used in expressing some of the problems. The root of these environmental problems is expanding world population and resulting natural resource deterioration. The world's population is rapidly consuming many nonrenewable natural resources and contributing to an environmental deterioration process. Man has risen in numbers and applied technology in resource use at the expense of natural environment.

In response to these problems, people from various nations and walks of life have tried to help the situation in several ways. Improvement of technology and reduction of the population growth are among the priorities. Mobilization of educational forces is also part of the broad response which promises to help shape the knowledge, skills, and values of future citizens who will do more than maintain the current level of struggle.

In Thailand, as in most other developing countries, the process of environmental deterioration has kept pace with rapid population growth. Only a small number of its citizens seem to be aware of environmental danger. The major response from young people comes from students who have some education in environmental areas. Presently, it seems

necessary for Thai citizens to be aroused and informed of environmental deterioration. Environmental education will be a good tool to help Thai population obtain the knowledge and incentive necessary to make wise decisions toward environmental policy. This study will develop some general guidelines for implementing environmental education for Thai citizens in the future.

I. ORGANIZATION OF THE STUDY

Due to the complexity of subject material in this study, data and information were collected from various sources. In addition to the extensive use of library facilities at the University of Tennessee, other information and figures were acquired from Thailand. A number of letters were also used in consulting with personnel participating in related fields of the study.

The study has been organized in four chapters. Chapter I is the introduction in which organization of the study, general background of Thailand, statement of the problems, objectives and purposes of the study, and scope and limitations of the study are presented respectively. Chapter II is devoted to the identification of environmental education components concerning Thailand. Socioeconomic setting, forestry, and resource-use setting are the main topics examined. Chapter III deals with suggested approaches to environmental education in Thailand. The first part of this chapter is concerned with the general concept and philosophy of environmental education. This is followed by a set of

generalized approaches to environmental education for Thailand.

Chapter IV is the summary and recommendations.

II. GENERAL BACKGROUND OF THAILAND

Thailand or Muangthai, which means "The Land of Free," was formerly known as Siam. The country, approximately 200,234 square miles in area, is situated in southeast Asia (Appendix A). On the north it is bounded by Burma and Laos, on the east by Cambodia and Laos, on the south by Malaysia, and on the west by Burma. The coast lines extend north and south bordered on the eastern flank by the Gulf of Thailand and on the western side by the Andaman Sea.

Geographically, Thailand may be divided into four large regions: North, Northeast, Central and South. The Northern region is characterized by extensive hardwood forests from which come one of Thailand's well-known exports, teak. Within this region are series of hills and mountain ranges which run parallel to one another. This geology forms the most important headwaters of the four principal rivers, Ping, Wang, Yom and Nan, all of which converge to be the Chow Phya River meandering through the central plain of Thailand.

The Northeast is dominated by a large plateau whose western and southern scarps are tilted eastward towards the Mekong River, a natural boundary between Thailand and Laos. The plateau is characterized by fairly poor soil and scanty rainfall, yet deciduous forests in this region supply a very important source of valuable hardwood trees. One third of Thailand's people live here, farming at little more than subsistence level.

The Central Plain is the geographic and economic heart of the kingdom. The plain area consists of flat, deltaic, alluvial soils, covered with a dry, deciduous monsoon forest in which bamboos predominate. During the flood season, rich alluvial muds are brought down from the North by the Chao Phya River and deposited throughout the delta region. It is this annual flooding which results in the extreme fertility of the rice plain, known as "the cradle of the finest rice in the world." Bangkok, the capital of Thailand, is also situated in the Chao Phya Delta.

The South is a narrow sliver of rugged mountains extending southward to the Malaysia border. The peninsular, with average annual rainfall of 87 inches, bears the country both luxuriant commercial evergreen species and Para rubber trees. The area is also rich in tin and wolfram ores.

The system of governmental administration is such that the whole country is divided into 71 provinces or "Changwards" which are subdivided into districts or "Amphurs." Each Amphur is divided into communes or "Tambols" and villages respectively.

The 1970 census shows a total population of 34,397,374, with an average annual rate of population growth of 2.66 percent, for the whole kingdom.

III. STATEMENT OF THE PROBLEMS

The unique characteristics of the people and historical background of Thailand complicate the environmental problems. Three main factors

which contribute to these problems are: population growth, misuse of natural resources, and economic development of the country.

The population explosion is seen to be the primary factor that causes several other problems. In his studies about social and economic development of Thailand, Silcock pointed out:

The rapid rise in population is due in Thailand as in other less developed countries to success in controlling the death rate while the birth rate has changed little. This has led to the usual problems: difficulty in creating new capital fast enough because of the need for supplying an expanding labour force with the existing level of capital per head; difficulty of maintaining consumption standards and educational standards because of the increasing number of children per worker; and increasing tenancy, difficulties of forest conservation, and other evidences of pressure on the land. Thailand has no overall shortage of land yet, but its government is beginning to feel some anxiety at the cutting down of the forests (particularly, of course, the teak forests) and the danger of erosion or even climate changes as a result (37:290).

Population growth has been accelerating and causing several serious problems to the nation's environment. Forested lands have been cleared and converted into agricultural lands with little thought about resulting environmental problems. Pesticides and metallic contaminants are carelessly applied in the field to increase crop production. Waste disposals are released and accumulated on the land as well as in the water. More and larger industrial plants are established in order to meet the needs of the population. More automobiles and trucks are added on the roads and highways to keep up with modern transportation. Urban environments are being developed while natural environments are being depleted. These conditions have led to air and water pollution, which are controversial issues in Bangkok and other urban areas at present.

Misuse of natural resources is another cause of environmental problems. Thailand is an agricultural country by nature. Over 80 percent of its population are engaged in agriculture (26:11). Since the population is increasing, the need of land for agricultural purposes is inevitably increased. Forested land has long been a primary source of new agricultural land. Due to the increased need for agricultural products, state owned forested lands are being illegally cleared. Fire is usually set to help clear the forested land. Cubic metres of valuable timbers and other forest resources have been recklessly burnt. Fire also destroyed wildlife habitat and developed new habitats for pests.

As the conversion of forested lands to agricultural lands in the more accessible areas is limited, either by poor soil or protection by forestry officials, conversion activities will move deeper in remote areas or up to the slope of the mountains. This is detrimental to watershed areas and overall soil and water conservation. So far, thousands of acres of headwater areas have been cleared and turned into agricultural lands. These illegally-occupied lands have caused very serious problems to watershed management as well as soil and water conservation.

In 1960, Thailand adopted its first National Economic Development Plan. This plan covered a period of six years, 1961-1966. Its major goal was to increase per capita income. The plan concentrated on building up infrastructure facilities such as the construction of irrigation works, building and improvement of roads and other means of transport, and the provision of inexpensive electric power. The keynote

of this plan was the encouragement of economic growth in the private sector. Thus, measures to promote increased agricultural production and industrial expansion were emphasized. Land classification and forest reservation projects were also included in the plan (Appendix B).

One serious shortcoming of this plan was the lack of effective land-use planning. Land classification and forest reservation were far behind schedule during the period of 1961-1966. Economic growth seemed to be the only criterion used in the plan. Several dams were built, either for power or irrigation purposes. Large areas of valuable forests were flooded for new reservoirs. Furthermore, some other forests were established as land settlements for the people who were removed from flooded areas. New highways and roads were also constructed to open the gate for new communities. Forest officials had a hard time protecting forests along the new highway areas. New upland crops were introduced and developed to be important exports. Of course, the most suitable places to grow these crops are the newly developed agricultural lands which used to be valuable forests. The third National Economic Development Plan for the period of 1972-1976 is presently active but the land-use project is not accomplished yet. At the end of 1973, only 87 million rais (2.5 rais = 1 acre) were reserved as National Reserved Forests. This figure showed that only 55.89 percent of the proposed plan (Appendix B) was accomplished. Forestry problems and the causes of the delay in forest reservation will be identified in Chapter II.

As Silcock (37:290) pointed out, rapid growth of population has led Thailand to several problems. The standard of education is one of those

problems. It is apparent that Thai people lack an understanding and knowledge about their physical and biological environment. Misuses of natural resources are going on very rapidly in the rural and remote areas. Nonrenewable natural resources are being recklessly consumed. The majority of the people seem to be unaware of environmental deterioration. There is very little response to the ecological crisis because few people are aware of the real situation.

It is necessary for Thailand to develop an awareness and understanding of its environmental problems among the citizens and, then, inform them to take an active role in preventing environmental deterioration. This can be achieved by effective environmental education.

IV. PURPOSE AND OBJECTIVES OF THE STUDY

The overall purpose of the study is to develop some generalized approaches to environmental education which can be used effectively as a guide to produce a citizenry that is aware of the biophysical environment and its associated problems and motivated to work toward their solution.

The specific objectives of the study are:

1. To identify and examine the important components affecting environmental education to Thailand.
2. To develop some generalized approaches and guidelines for environmental education in Thailand.

V. SCOPE AND LIMITATIONS

The scope of this study included two major areas: firstly, components of environmental education concerning the Thai situation were examined; and secondly, the necessary approaches to environmental education were suggested to coincide with the present situation in Thailand.

Environmental education, according to this study, included the physical environment in which forestry and resource-use practices were among the principals. Most of the approaches in this study were directed to the young people in Thailand. Nevertheless, in-service training for teachers as well as education for the general population were also considered.

CHAPTER II

EXAMINATION OF ENVIRONMENTAL EDUCATION COMPONENTS

I. SOCIOECONOMIC SETTING

People

Thai people were first identifiable about 4,500 years ago in northwestern Szechuan, and were gradually forced southward by Chinese pressure. The first wave of these migrations occurred at the beginning of the Christian era, and in the meantime, they came to call themselves Thai.

The Thais followed the river valleys in their movements towards the south. Those who descended along the Salween river settled in the northwestern of present-day Thailand and became Shans or so-called Thai Yai. The eastern groups spread throughout the Mekong valley and constituted the ancestry of the Laotians. The central movement ultimately came into the Chao Phraya valley, what is now the Central Plain of Thailand. The people of the Mekong and Chao Phraya Valleys have been referred to as the Thai Noi.

After several minor migrations, the present capital (Bangkok) was founded in 1782. At that time the size of the kingdom was twice the present. Under French and British pressure, during the late eighteenth century, the area of Thai suzerainty was halved and became parts of present-day Laos, Cambodia, and Malaysia. The pressure was stopped in 1909 when Thailand's territory became permanently fixed.

Demographic characteristics. Several attempts were made to estimate the population during the nineteenth century. There is general agreement that the population inside the present borders probably rose from about four million inhabitants to approximately six million during the two centuries preceding 1900.

The population and average annual rate of population growth from 1911 to 1970 are presented in Table I. These estimates indicate that the country's population has increased three times in the half-century that followed the final stabilization of the borders.

Before 1947 Chinese immigration (10:63) and an excess of births over deaths were the most important factors contributing to the increasing population. Due to a decrease in immigration since 1947, the excess of births over deaths has been the only main factor. Indeed, it is noteworthy that the rate of population growth was greatest between 1947 and 1960, the only period when it can be explained almost wholly in terms of natural increase.

The government of Thailand became aware of this rapid increase in the rate of population growth in 1962 when the results of the 1960 census were known. No one feared actual food shortage but the view was expressed that rice exports might eventually decrease. By the mid-1960s the Thai government directed further attention to population pressure and family planning policy was activated to a large degree. Nevertheless, by 1970 the population had reached 34 million and was growing by more than one million per year.

TABLE I
THAILAND: TOTAL POPULATION AND GROWTH RATE, 1911-1970

Year	Estimate	Population (,000)	Average Annual Rate of Population Growth (Percent)
1911	Census	8,266	0.7
1919	Census	9,207	1.4
1929	Census	11,506	2.2
1937	Census	14,464	3.0
1947	Census	17,443	1.9
1956	Survey	20,095	-
1960	Census	26,258	3.2 ^{1/}
1970	Census	34,152	2.7

Note: 1/ Calculated for the period 1947-1960.

Source: J. C. Caldwell, "The Demographic Structure," Thailand: Social and Economic Studies in Development, ed. T. H. Silcock, p. 29. Canberra: Australian National University, 1966; and National Statistical Office, Bangkok, Thailand.

The latest census of Thai population was conducted in 1970. During the intercensal period, population increased by 30.1 percent (29:39). It was the first time that Thailand had simultaneously conducted both population and housing censuses. At present, processing of data of this census is underway at the National Statistical Office. Consequently, some details are not yet available. However, an analysis of the preliminary results has revealed some facts and figures.

In 1970, there were about 34 million people in Thailand (Table II). The sexes were almost evenly balanced, females exceeding males by a little more than one-third of 1 percent. The preliminary report also showed that more than 55 percent of the population was under 20 years of age.

The distribution of population in Thailand in 1970 by region was: 21.9 percent were residents of the North; 35.2 percent in the Northeast; 30.4 percent in the Central; and 12.5 percent in the south. The population tended to be concentrated in Bangkok and its suburbs. Over three million people lived in Bangkok metropolitan areas. River valleys and flood plains were other places with dense population.

According to the 1960 census, over 98 percent of the population had been born in Thailand and about four fifths of the remainder in China. Similarly, over 98 percent were Thai citizens. Of the balance, 90 percent were Chinese citizens, and most of the rest were of some other Southeast Asian countries. Only 3 percent could not speak Thai, and only 6.4 percent were not Buddhists.

Of persons over 10 years of age, 81 percent of males and 61 percent of females were literate. The rate of literacy has reached 91 percent

TABLE II
THAILAND: POPULATION BY AGE AND SEX, 1970

Age Group	Number			Total of Percent
	Male	Female	Total	
All Ages	17,123,862	17,273,512	34,397,374	100.0
0-4	2,862,938	2,796,232	5,659,170	16.5
5-9	2,679,168	2,605,723	5,284,891	15.4
10-14	2,309,549	2,252,650	4,562,199	13.3
15-19	1,832,177	1,885,371	3,717,548	10.8
20-24	1,321,641	1,361,717	2,683,358	7.8
25-29	1,098,083	1,143,377	2,241,460	6.5
30-34	1,047,323	1,077,088	2,124,411	6.2
35-39	952,959	957,607	1,910,566	5.6
40-44	774,328	766,332	1,540,660	4.5
45-49	599,118	597,454	1,196,572	3.5
50-54	472,185	489,794	961,979	2.8
55-59	388,328	401,731	790,059	2.3
60-64	300,801	324,223	625,024	1.8
65-69	212,957	238,901	451,858	1.3
70 and over	250,656	353,486	604,142	1.8
Unknown	21,651	21,826	43,477	0.1

Source: Preliminary Report of the 1970 Population and Housing Census of Thailand, National Statistical Office, Office of the Prime Minister.

among 15-19 year old males. Of the population over 6 years of age, 69 percent of males and 56 percent of females had experienced some schooling. These proportions rose to 92 percent and 88 percent in the 14-17 age range for males and females respectively (10:36).

Culture and occupation. A typical Thai has been described as religious, conservative and having preference for the communal village life. It is not easy to break the ties of culture and tradition which have induced him to become a farmer. Buddhism has long dominated the Thai way of life. It has been traditional for young men in Thailand to enter the monkhood when reaching twenty years of age. The period of monkhood is traditionally during the three-month Buddhist lent. The sociological influence of Buddhism has also affected administrative practices of the government. A temporary leave of absence with full salary is granted to all civic servants who wish to spend some time in a monastery as a Buddhist monk.

All persons residing outside of municipal areas are considered rural and nearly all reside in villages. The typical rural community has been a cluster of houses surrounded by fields which the residents own and work. The farming unit is the family, consisting of the husband with the wife and unmarried elder children as unpaid family workers. Married sons soon acquire their own farms, and married daughters join their husbands as sources of farm labor. The parents usually keep one of their children, whether married or not, to stay and take care of them when they get older. The average household size in all parts of Thailand is between five and six persons (45:65).

Thai society is highly centralized, and the most important policy decisions are made in Bangkok. Concentrated in Bangkok are the military and civilian leaders who head various ministries, the leading civic servants, most of the leading Chinese merchants, the leading members of the Buddhist clergy, and the King. These men's decisions affect large blocks of resources directly. Sometimes they influence the framework of rules, regulations, and laws which condition the behavior of rural and urban Thais in using their own assets. Everyone looks to the central government for guidance, especially when, change is imminent. Hence the opinion of the government is of vital importance for acceptance of national policy.

According to the 1960 census, 83 percent of males and 77 percent of females were economically active. As shown in Table III, 79 percent of economically active males and 86 percent of economically active females were employed in farming, fishing, and forestry, nearly all in farming.

However, there are signs of occupational trend change. After Thailand established its first National Economic Development Plan (N.E.D.P.) in 1960, the percentage of nonagricultural employment has been increasing. The transportation industry has expanded rapidly with resulting increases in employment. Land transport has predominated over water transport in terms of employees by the unprecedented ratio of four to one (10:50). Manufacturing and construction employed more people during the last few years. Although the growth of nonagricultural industries in itself has changed employment patterns, the scarcity of agricultural lands has contributed to increased employment in other areas.

TABLE III
EMPLOYED POPULATION^{1/} OF THAILAND BY INDUSTRY, 1960

Industry	Male		Female	
	Number (,000)	Percent	Number (,000)	Percent
Agriculture ^{2/}	5,575	79	5,757	86
Manufacturing	293	4	177	3
Commerce	363	5	416	7
Transport and communications	156	3	9	-
Services ^{3/}	458	6	197	3
Miscellaneous ^{4/}	99	1	15	-
Unknown	148	2	86	1
All industries	7,092	100	6,657	100

Note: 1/ Over 10 years of age.

2/ Includes agriculture, forestry, fishing and related workers.

3/ Includes public service.

4/ Includes construction, repair and demolition, mining and quarrying, electricity, water and sanitary services.

Source: J. C. Caldwell, "The Demographic Structure," Thailand, Social and Economic Studies in Development, ed. T. H. Silcock, p. 50, Canberra: Australian National University, 1960; and National Statistical Office, Bangkok, Thailand.

Youth activities and organizations. Youth clubs in Thailand have not met with much success. Failures seem to come from many aspects but poor organization seems to be the main problem. This leads to lack of participation and sponsors plus a lack of club recognition from the general population. The clubs sponsored by the government seem to be more successful since sufficient funds and people are available to support club activities. The most successful youth organizations in Thailand are Boy Scouts of Thailand and Yuwa Kasetkorn (Young Farmer's Club).

Boy Scouts. Boy Scouts of Thailand is the biggest youth organization of the nation. As shown in Table IV, there were 698,180 members in 1973, and 51,731 of them were Scoutmasters who work voluntarily for the organization. Most of the Scoutmasters are full-time teachers.

The scout movement in Thailand was started by King Vajiravudh in 1911, and has been active in Thailand ever since. At present, the organization is conducted under the Ministry of Education. It has four sections: Cub Scouts for small children between ages 8 and 11; Boy Scouts between ages 11-1/2 and 15; Senior Scouts between ages 15 and 17; and Rover Scouts between ages 17 and 25. The organization is considering another section of scout, called Villager Scouts, for older people interested in joining the Scouts.

Boy Scouts programs in Thailand have been popular and appreciated by the entire population. Most of the boys who have finished secondary school have had some scout training. The training is designed to encourage self-reliance, initiative and resourcefulness, through the

TABLE IV
SCOUTS IN THAILAND, 1973

Classification	Troop	Scouts
Cub Scouts	8,590	264,187
Boy Scouts	7,549	343,024
Senior Scouts	861	38,271
Rover Scouts	47	967
Sub Total	17,047	646,449
Scoutmaster		51,731
Total		698,180

Source: Boy Scouts of Thailand, Annual Report of Boy Scouts Affairs, 1973 (in Thai), p. 38. Bangkok, Thailand: Office of the National Boy Scouts Executive.

Badge system and its progressive tests. Boy Scouts programs are largely decentralized throughout the nation. Through government support, Boy Scouts courses have been integrated into the existing curricula of primary and lower secondary education since 1973.

Yuwa Kasetkorn. Yuwa Kasetkorn is an organization for young people of Thailand which is patterned after the 4-H Clubs of the United States. Membership is open to rural boys and girls who agree to carry out approved projects, attend meeting, and submit individual reports. This activity was started in Thailand in 1950 by Prayathepparsartsathit but was not active until March 16, 1953 when the Department of Agriculture took full responsibility for the Yuwa Kasetkorn movement. At present the Yuwa Kasetkorn Section is organized by the Agricultural Relation Division, Agricultural Extension Department, Ministry of Agriculture and Cooperatives.

Funds are mainly provided by the government for the implementation of Yuwa Kasetkorn work. There are also some other private sponsors who take an interest in promoting and expanding this type of work. Local volunteer leaders are selected to help organize and advise club members on their home projects. About 80 percent of these local volunteer leaders are school teachers, the rest being other community leaders. The major responsibilities of the local leaders are to make supervisory visits of home projects with guidance and support from the Agricultural Extension Department. The local leader together with the club's committee conduct the monthly meeting, plan for the year's program, and supervise other such club activities.

Boys and girls between 10 and 25 years of age are eligible for membership. They agree to carry one or more home projects for which they assume full responsibility. Members have to complete an application form with the parents' approval, keep an accurate record of the project, attend club meetings, and complete both the project and record book at the end of the club year (April). The number of members as well as clubs are increasing every year. As shown in Table V, the members have increased from only 179 in 1953 to 48,995 in 1972.

The individual projects are the important part of Yuwa Kasetkorn work. Projects are mostly agricultural in nature and usually involve animal raising and food crops. Since home economic projects are quite new in Thailand, there are not many members engaged in this area. Forestry and natural resource development projects are not active at this time.

Economy

The economy of Thailand has been based on agriculture, including forestry and fishery. Rice and rubber are the most important major crops, followed by maize, teak, jute and kenaf, and cassava. Over 80 percent of the work force are engaged in agricultural production.

National economic development plan. Thailand has already activated three National Economic Development Plans (N.E.D.P.). The first N.E.D.P. was proclaimed on January 1, 1961 and had four major goals. The first, and most important, goal was to increase real per capita income. The plan recognized Thailand's limited availability of resources and hence the need for external assistance, both technical and financial.

TABLE V
 STATISTICS OF YUWA KASETKORN WORK IN THAILAND

Year	Clubs	Local Volunteer Leaders	Club Members
1953	4	8	179
1954	24	48	715
1955	48	96	1,440
1956	73	107	2,565
1957	81	162	2,630
1958	93	186	2,834
1959	109	243	4,230
1960	190	396	6,936
1961	222	512	8,454
1962	265	604	9,833
1963	441	868	15,216
1964	550	1,058	19,450
1965	638	1,332	21,869
1966	692	1,508	23,792
1967	984	2,343	32,403
1968	1,038	2,744	35,320
1969	1,147	2,826	39,642
1970	1,243	3,288	44,831
1971	1,223	3,289	45,319
1972	1,341	3,919	48,995

Source: Division of Agricultural Relations, Department of Agricultural Extension, Bangkok, Thailand.

The second goal was to emphasize the creation of adequate infrastructures on which further industrial and agricultural development could be based. A third goal was to maintain financial stability by maintaining currency and reasonable reserves. The last goal called for regional development plans to be drafted and implemented by regional development.

The keynote of the first Plan was the encouragement of economic growth in the private sector. Thus, measures to promote increased agricultural production of higher quality, were assigned first priority. Important aspects included establishing the agricultural infrastructure, the improvement and expansion of agricultural research, the diffusion of agricultural information and promotion of agricultural activities. In like manner, measures to encourage industrial expansion were established.

Planning was first concentrated on building the nation's infrastructure. This was the basic structure for economic growth, including facilities for transportation, communication, irrigation, electrical power, and agricultural research.

Following the first Plan, a second Plan for 1967-1971 and a third Plan for 1972-1976 were proclaimed respectively. The objectives of both Plans were similar to those of the first but put more emphasis on some areas such as education, public health, rural development, and social welfare. At present the third Plan for the period of 1972-1976, with emphasis on rural development and family planning, is underway.

National economic framework. Agriculture has long been the largest single contributor of income and employment to the nation. However, its relative importance is gradually declining. As shown in Table VI, the

TABLE VI
GROSS DOMESTIC PRODUCT OF THAILAND, BY INDUSTRIAL ORIGIN,
1958 AND 1968-1969

Industrial Origin	Amount (Millions of Baht)			Percent		
	1958	1968	1969	1958	1968	1969
Agriculture	19,859.4	36,962.1	41,675.1	40.7	31.5	31.9
Crops	13,562.6	25,834.9	28,834.9	27.7	21.6	22.1
Livestock	3,713.7	5,000.5	5,049.2	7.6	4.2	3.9
Fisheries	759.7	3,578.6	4,572.9	1.6	3.1	3.5
Forestry	1,859.4	3,038.7	3,218.1	3.8	2.6	2.4
Mining and Quarrying	608.7	2,114.6	2,472.8	1.2	1.8	1.9
Manufacturing	5,472.9	17,585.6	19,185.0	11.2	15.0	14.7
Construction	1,608.7	8,176.5	8,622.2	3.3	7.0	6.6
Electricity and Water supply	159.7	1,303.3	1,556.4	0.3	1.1	1.2
Transportation and Communication	2,536.2	7,320.6	7,958.1	5.2	6.2	6.1
Wholesale and Retail trade	8,502.2	20,278.8	22,892.6	17.4	17.3	17.5
Banking, Insurance and Real Estate	864.0	4,064.5	4,816.9	1.8	3.5	3.7
Ownership of Dwellings	2,499.3	2,424.0	2,557.0	5.1	2.0	1.9
Public Administration and Defence	2,489.1	4,991.1	5,565.0	5.1	4.3	4.3
Service	4,283.2	12,085.6	13,311.6	8.7	10.3	10.2
GROSS DOMESTIC PRODUCT (GDP)	48,919.4	117,306.7	130,612.7	100.0	100.0	100.0

Source: Office of the National Economic Development Board, National Income of Thailand, 1969.

ratio of agricultural output to the gross national product dropped from 40 percent in 1958 to 31 percent in 1969. This indicates a relatively rapid advance of industrialization in the country. Among nonagricultural sectors, commerce and other services accounted for 34 percent of the total value of national products. Manufacturing industry, the main activity of which is the processing of agricultural products, increased from 11 percent in 1958 to 15 percent in 1968 of the total value of national products. The output of the mining industry was relatively small, accounting for only about 2 percent of the gross national product. However, tin, which is the most important product of the Thai mining industry, ranks high among major export items of the country and is the main nonagricultural export.

Foreign trade plays an important role in the promotion of economic growth and stability of Thailand. The marked growth of the Thai economy in the post-World War II years owed much to the increased exports of primary products such as rice, rubber, teak, tin, and more recently maize, jute, kenaf, and cassava. Agricultural products accounted for 73 percent of the total domestic exports in 1972 (Table VII). This represented a decrease from 81 percent in 1968. In the agricultural product sector, the exports of rice, rubber and teak are decreasing while the exports of fishery products and other crops such as maize, jute and kenaf, and cassava are increasing. Teak exports declined in importance from 3.5 percent of total value in 1957 to 1.4 percent in 1963, and are still declining (20:314). This was due to excessively heavy cutting of teak in the past.

TABLE VII
EXPORTS: AGRICULTURAL PRODUCTS, 1968-1972

Product	Value in Million Baht				
	1968	1969	1970	1971	1972
Rice and Rice Products	3,809.2	2,966.9	2,552.6	2,917.9	4,453.4
Other Crop Products	4,049.5	4,473.3	5,187.3	6,278.6	7,513.8
Livestock and Livestock Products	176.5	203.9	218.2	238.5	386.3
Rubber	1,815.9	2,663.3	2,249.7	1,906.0	1,862.3
Forestry Products	274.3	296.7	275.7	367.4	479.6
Fishery Products	306.8	314.2	332.0	349.0	712.6
Miscellaneous Agricultural Products	159.6	183.0	182.2	338.1	489.1
Total Value of Agricultural Products	10,591.8	11,111.6	10,977.7	12,396.5	15,897.1
Percentage	81.6	78.8	77.0	74.3	73.5
Total Domestic Exports	12,987.4	14,100.8	14,250.4	16,682.9	21,615.9
Percentage	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Agriculture and Co-operatives, Agricultural Statistics of Thailand, Crop Year 1972/73, pp. 20-25, May 1974.

Education

Modern education in Thailand started during the reign of King Mongkut (1851-1868), and these beginnings were advanced by his son, King Chulalongkorn (1868-1910). However, the national educational system of Thailand did not make rapid progress due to financial difficulties and a shortage of teachers. As late as 1918-1919, only 20 percent of the male children of school age were enrolled (21:183).

The Primary Education Act was established in 1921 and a four-year compulsory education was instituted for children between 7 and 14 years of age. The Act was amended in 1935 and again in 1960. This led the way to the proclamation of the National Scheme of Education in 1960.

The National Scheme of Education was put into effect on April 1, 1961. Under this program, there are four levels of education in Thailand: preschool, elementary, secondary, and higher education.

Preschool education. Preschool or kindergarten level is not compulsory. Parents are encouraged to send children, between the ages of 4 and 7, to school so they will be better prepared for the next stage of elementary education. There were only 153,573 children enrolled for preschool education in 1972 (Table VIII).

Elementary education. Compulsory education begins at the primary or elementary school level. This level is divided into two parts, the Lower Prathom schools (grade 1-4) and Upper Prathom schools (grade 5-7), the latter being an extension of the former. The law requires children to enter elementary school at the age of eight.

TABLE VIII
ENROLLMENT IN GOVERNMENT AND PRIVATE SCHOOLS, 1972

Grade	Total	Male	Female
Kindergarten and Preprimary	153,573	80,563	73,010
Lower Elementary	5,015,628	2,611,199	2,404,429
Upper Elementary	1,133,925	647,462	486,463
Lower Secondary	595,648	350,680	244,968
Upper Secondary	69,440	37,769	31,671
Total (All Grades)	6,968,214	3,727,673	3,240,541

Source: National Statistical Office, 1972 Advance Report on Education Statistics.

The State is responsible for the organization of education at the Lower Prathom level for the benefit of the entire population in accordance with the Primary Education Act. There were 5,015,628 pupils in 1972, the highest number of any category.

Upper Prathom schools (grades 5-7) are organized as a continuation of those of the Lower Prathom in order to raise the standards of basic knowledge of the people. There were only 1,133,925 pupils in 1972 because it is not compulsory at this level. A majority of the children prefer to drop out of school after they finish the Lower Prathom level.

Secondary education. Secondary education aims at exploring and developing interests and aptitudes of children. The knowledge and skill acquired should enable them to carry out an occupation, and form the foundation for further education. It is divided into lower secondary comprising three grades and the upper secondary comprising not more than three grades.

Before the present National Scheme of Education, students who passed their elementary examinations had a choice of two distinct types of secondary school, the vocational secondary school or the academic secondary school. Students who went on to vocational secondary received mainly vocational training to allow for more time for their vocational courses. Leaving such schools, those students had little possibility for further study.

Under the new Scheme, students may still go on to either an academic secondary school (Mathayom Suksa) or a vocational secondary school. Both types of secondary schools offer identical general

curriculum of an academic nature, but have additional courses in accordance with the school's specialities.

The academic secondary school system, like the elementary, is divided into two levels. The lower academic secondary is a three-year course which provides a foundation for further academic study and vocational training. The upper academic secondary is a two-year preuniversity education which prepares students for education in universities, colleges, or higher vocational institutions. It comprises three sections: arts, science, and a general section.

The vocational secondary school system is also divided into two levels, lower and upper (intermediate vocational education). Each level covers a period of three years. The lower level provides training in fundamental vocational knowledge and skills. Students who finish at this level may continue their education at the intermediate level which provides an extension of vocational secondary education to increase earning capacity and affords a background for training at the university and college level.

Higher education. Prior to the establishment of the National Scheme of Education in 1960, there were only five universities in Thailand, all being situated in Bangkok. In supporting the Scheme, an effort has been made to upgrade the quality of university-level education and decentralize higher education in regions outside Bangkok. As a result, higher education institutions have been rising in both numbers and quality. At present, there are more than 15 institutions

throughout the country which offer undergraduate and graduate courses in several branches.

The Military, Naval, Air Force and Public Academies also provide instruction equivalent to that of higher education. These institutions are available to students who desire to pursue military or police professions.

II. FORESTRY AND RESOURCE-USE SETTING

Status of Forestry in Thailand

The forests of Thailand may be classified into two main categories: Evergreen and Deciduous. The Evergreen constitutes about 30 percent of the total and may be subdivided into Hill-Evergreen, Conifers, and Mangrove. The Deciduous may be subdivided into Mixed Deciduous which accounts for about 25 percent of the nation's forests, and Deciduous Dipterocarps comprising 45 percent of the total.

The forests are rich in timbers of commercial value such as Teak, Yang and many other hardwood of the genera. Native pines comprise only two species, *Pinus merkusii* and *Pinus khasya*. The Pine Forest constitutes approximately 1 percent of the total forest area and is dispersed in the North and Northeast. Minor products of economic value such as bamboo, rattan, wood oil, gums and incense woods are also found in the forest.

Forest ownership. Except for some small coastal pieces of land held privately for growing mangrove for firewood, all the forest areas throughout the Kingdom are State-owned. However, the national policy

is now underway for the encouragement of private forestry practice in alienated lands and in poorly stocked as well as degenerated forest reserves.

Administration and policy. The forest administration in Thailand may be divided into two major divisions: Central Administration and Territorial Administration. The Central Administration or Royal Forest Department is situated in Bangkok. In the present form of organization, it is divided into eight Divisions. There were 1,476 employees under the Central Administration in 1972 (25:192).

The Territorial Administration is more complex than the former. It consists of 21 Territorial Divisional Forest Offices, 67 Provincial (Changwad Forest Offices) and 470 Amphur Forest Offices. The Territorial Divisional Forest Officers are directly responsible to the Royal Forest Department while the Provincial and Amphur Forest Officers are directly answerable to the Provincial Governors. There were 5,219 employees working under the Territorial Administration in 1972 (25:192).

As the forest of Thailand is the property of the State, the policy of the government has always been to manage its forests for the benefit and welfare of the general public. The sustained supply of forest products for local consumption and export trade, and the maintenance of forest cover for the protection of watersheds, are the main objectives of the forest policy of Thailand.

The present trend of forest policies is oriented towards increasing production, reforestation, and development and expansion of forest industries. The proposed scheme to encourage private forestry practices

has also been approved. Also, the policy of reserving 50 percent of the area of the country as permanent forest lands has been enunciated by the government in the National Economic Development Plan (Appendix B).

Forestry problems. The causes of forestry problems in Thailand may be stated from two points of view: lack of trained staffs in the past and population pressure at present. A policy of reserving forest areas for both productive and protective purposes was initiated in 1938 (35:23) but was largely ineffective for lack of trained staff. It was more than twenty years later when a national forestry plan (Appendix B) was adopted, and reservation began to be undertaken in earnest as new staffs were trained (37:297). Banijbatana (7:6-7) has also pointed out that the lack of technical knowledge and equipment to conduct scientific research on wood utilization was another forestry problem.

The rapid rise of population in Thailand has caused several serious problems to forestry. Increasing tenancy, ineffective forest reservation, and other evidences of pressure on the forestland have resulted from the rapid growth of Thai population (37:290). Forests have been dwindling quite rapidly in land areas and valuable growing stocks, particularly in the more accessible areas but also in the watershed areas of important rivers.

The valuable teak forests in the more accessible areas on the lower hill slopes, mostly in the North, have been carelessly cleared and turned into other farm crops. Similarly in the Northeast, the forests in the watershed areas have been denuded both for shifting and permanent

cultivations. Para rubber plantations, orchards, and tin mining are responsible for the destruction of more than half of the tropical rain forests in the South. These illicit clearings of the forests for cash crops by local villagers constitute one of the major problems of forestry in Thailand today.

The nomadic hill tribes, which are estimated to be 500,000 in number, are another problem to forestry management in Thailand (6:6). They continuously migrate between the border of Thailand, Burma, China, Laos, and Cambodia and have already cleared thousands hectares of forests in watershed areas in the North. These areas are considered to be very important headwaters of the four main rivers in the North.

Illegal cutting or harvesting of timbers as well as other forest resources is another problem to forest development in Thailand. In the reserved forests, several management plans were not able to be accomplished because of the lack of growing stocks. The shortages of growing stocks were mostly caused by illegal cutting of timbers by sawmillers and villagers. The Royal Forest Department has spent quite a lot of its budget every year to protect and maintain the reserved forests, as well as for reforestation activities in the important watershed areas which were denuded by nomadic hill tribes and villagers.

Forestry development. The forest deterioration activities have directly caused the delay of forest reservation plan. As stated in the National Economic Development Plan in 1960, 156 million rais or 50 percent of the total area were to be set aside as permanent forestland. The progress is such that up to the end of 1972, only 87 million rais

were actually reserved forests. It is feared that the reserved forests may not exceed 125 million rais or 40 percent when the plan comes through.

During the past few years the importance of forestry to Thailand has apparently been recognized more by the government and several plans were made in complementing the forest development of Thailand. Through the National Economic Development Plan, more land has been designated as the National Reserved Forests. The Royal Forest Department has also planned to create 14 National Parks, 18 Forest Parks and at least 12 Arboreta for the recreation and education of the entire population. At present, most of the Forest Parks and Arboreta have been developed and four National Parks have been established.

Forest-protection is the main concern of the Royal Forest Department. Of all the factors causing damage to the forests, the human factor rates highest in Thailand, while damage by insects and fire are less alarming and irrepressible (34:10). Several attempts have been made to effectuate suppression of forest crimes, mostly by increasing law enforcement. There are also Forest Protection Units set up in various localities that are considered vulnerable to timber stealing and illegal forest clearing. So far 200 units have been established, and the number is to be gradually increased until the final target of 644 has been attained. The Forest Protection Unit, as its name indicates, serves as reenforcement for the Provincial and Amphur Forest authorities in the suppression of crimes against forest laws.

Reforestation and forestry research are the other plans which have been emphasized by the Royal Forest Department. As of 1973, more than

300,000 rais of teak and other wood plantations had been planted. Researches in the field of forestry have been encouraged and supported by the Royal Forest Department mostly in the area of Silviculture and Forest Products.

Forestry education. Forestry education in Thailand has been done mostly at the professional level. Faculty of Forestry, Kasetsart University, offers undergraduate and graduate courses in Forestry. There are approximately 80 annual graduates. Also, a two-year ranger program for the promising junior staff is offered at the Prae Forestry School. This school is conducted by the Royal Forest Department. The current number of students admitted annually has increased to 200 students due to the rapid expansion of various phases of forestry development in Thailand.

In addition, short courses are given occasionally by the Royal Forest Department for subordinate officers and/or outsiders. These may be conducted from two weeks to three months and the courses are generally in Nursery Technique, Wood Identification, Wood Seasoning, and Wood Preservation.

Forest extension. Forest extension in Thailand has always been conducted on the basis of general public relations and in cooperation with other governmental agencies. Extension also occasionally participates in the Fairs, essay-writing contests, television and radio programs, and informational publications. At present, the Extension work is conducted by a small Section within the Office of the Secretary.

The Forest Extension activities have not been extensive due to the limitation of budget allowance.

Agricultural Development

The objectives of agricultural development in Thailand are to improve, expand and diversify agricultural production, as well as to improve the social condition in rural areas. These objectives have been translated in several agricultural development projects, most of which are operated by the Ministry of Agriculture and Cooperatives.

Diversification and promotion of new agricultural crops have achieved the most success in agricultural development. External trade has also played an important role in helping developing of new economic crops. New crops have become important new resources of foreign exchange. The traditional "big four" exports, rice, rubber, tin, and teak, have declined substantially in relative importance. In 1968, for example, these four products accounted for only 52 percent of total merchandise exports, compared with 80-90 percent prior to 1950 (20:265). The new exports that have emerged include maize, kenaf and jute, tapioca, and fishery products. The vigorous growth in these new export crops has imparted a stimulus to Thai economy in recent years.

As shown in Table IX, the productions of maize, kenaf and jute, and tapioca have increased more than 200 percent from 1963 to 1973. The planted areas of these crops have tripled from 1960 to 1973 (Table X).

The establishment of Department of Agricultural Extension, within the Ministry of Agriculture and Cooperatives in 1968, was another important step in development of agriculture in Thailand. Prior to this

TABLE IX

INDEX OF AGRICULTURAL PRODUCTION^{1/}

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Paddy	92	100	95	92	135	112	124	134	132	135	123	143
Rubber	98	100	106	110	110	111	130	142	144	159	164	194
Maize	78	100	109	119	131	141	175	198	227	271	152	268
Kenaf and Jute	64	100	142	246	308	196	147	160	137	171	202	270
Tapioca	98	100	74	70	90	98	124	128	142	161	180	225
Coconuts	96	100	96	102	93	94	96	63	65	64	62	65
Sugar cane	67	100	107	95	81	96	123	142	156	170	192	276
Tobacco leaves	102	100	130	150	174	156	170	206	217	229	227	221
Kapok	66	100	109	109	96	122	122	97	113	127	113	130
Ground nuts	100	100	103	116	195	116	140	160	164	177	180	185
Cotton	85	100	101	123	183	166	271	264	109	167	128	134
Other crops 2/	81	100	86	89	115	140	154	139	145	166	178	178
Forest products 3/	88	100	100	117	111	132	155	136	142	151	132	121
Animal products 4/	102	100	98	98	106	110	113	116	119	122	126	115
Fish catch	80	100	127	135	154	178	223	258	296	323	342	394
Total	89	100	102	107	131	123	138	145	150	162	156	179

Note: 1/ A new agricultural production index (1963 = 100) is compiled beginning from July 1969 issue. Its features are: (a) Broad coverage representing about 80 percent of total agricultural production; (b) Weight based on 1963 values of agriculture revised annual survey according to 1963 agriculture census; and (c) Use of National Statistical Office estimates for paddy from 1966.

2/ Consist of mung beans, castor beans, soybeans, sesame, ramie, shallot and onions, garlic, and chili.

3/ Consist of teak, yang, firewood, charcoal, and bamboo.

4/ Consist of buffaloes, cattle and swine.

Source: Bank of Thailand, Bangkok, Thailand.

TABLE X
 AREA PLANTED OF PRINCIPAL CROPS, 1960-1972

Year	1,000 rais				
	Rice	Rubber	Corn	Cassava	Kenaf
1960/61	37,012	3,009	1,785	447	877
1961/62	38,619	3,080	1,916	621	1,190
1962/63	41,168	4,625	2,050	767	712
1963/64	41,229	4,755	2,612	875	957
1964/65	40,872	4,875	3,449	656	1,365
1965/66	40,961	4,985	3,605	637	2,401
1966/67	46,454	5,085	4,083	814	3,314
1967/68	41,612	5,175	4,138	880	2,177
1968/69	45,173	5,255	4,139	1,066	1,585
1969/70	47,400	5,325	4,248	1,193	2,358
1970/71	46,840	5,385	5,180	1,403	2,631
1971/72	47,043	5,435	6,368	1,384	2,891
1972/73	44,620	5,485	6,231	2,039	2,951

Source: Ministry of Agriculture and Co-operatives, Agricultural Statistics of Thailand, Crop Year 1972/73, p. 30, 52, and 67, May 1974.

time, agricultural extension-type services had been carried on by various Departments in the Ministry of Agriculture; Rice, Agriculture, Livestock, Fishery, and Forestry. Each of these Departments had their own extension programs. At the same time, Land Development Department of the Ministry of National Development performed some land development extension-type services. Besides these Departments, there were some other types of work similar to agricultural extension such as rural development and self-help land settlement that were undertaken by other Ministries.

The organization of Agricultural Extension Department started when the two largest Extension Divisions of the Department of Rice and Agriculture were joined together. Both Divisions had done some extension services on agricultural extension before they were combined together. The combination of these Divisions has resulted in more effective agricultural extension during the last recent years. An effort is being made to join together the other related agricultural extension-type services within the Agricultural Extension Department. The reentering of the Department of Land Development and Department of Irrigation in the Ministry of Agriculture and Cooperatives in 1972 showed a good sign in the development of agricultural extension service in Thailand.

Land Development

Most of land development projects are conducted by the Department of Land Development. As its name indicates, the Department was organized after the adoption of the first N.E.D.P. in order to conduct land resource development projects. There are four main projects being

carried out by the Department of Land Development. They are: Land Classification; Soil Survey; Soil and Water Conservation; and Land Policy.

Land Classification and Soil Survey are the main projects. Both projects have been undertaken promptly after the proclamation of the first N.E.D.P. They were delayed at the beginning due to lack of trained personnel but were well underway as staff became trained. Research on land-use development is conducted under the Soil and Water Conservation project. The project also includes extension-type services in the areas of land development. Land Policy project implies mainly on researches concerning Land Economics and also assisting farmers on decision-making as well as land tenancy.

Rural Development

Rural development is one of the major concerns of the government today. The government is presently engaged in a number of activities which may be grouped into three categories. They are: Land Allocation and Land Settlement; Community Development; and Public Service.

The land allocation and land settlement activities are administered by several government agencies, e.g. the Department of Public Welfare, the Cooperative Settlement, and the Land Development Department. However, the main purposes of these programs are the same, to provide land, social assistance and means of livelihood to the people who do not have their own lands and wish to engage in agriculture in the provided areas.

The main objective of the community development program is to coordinate activities of various government agencies, particularly in the fields of education, agriculture, health services, and public utilities. The principal duty of community development workers is to arouse the interest of the people in carrying out different projects for the community and to give some technical, financial and material assistance where necessary.

Public services include supplying water for drinking and other purpose, health services, construction and maintenance of rural roads and small irrigation projects.

The Thai government has seriously considered the development of its natural resources when the first National Economic Development Plan was adopted in 1960. Following this Plan, several national policies concerning resource-use have been made in guiding resource development projects.

Looking at agricultural development policy as a whole, there have been several coordinated plans to encourage the establishment of agricultural infrastructure, the improvement and expansion of agricultural research, the diffusion of agricultural information, and the diversification and promotion of new agricultural crops.

The diversification and promotion of new agricultural crops has been the most successful task. The production and planted areas of new agricultural crops such as corn, kenaf, and jute have increased very fast since 1960. However, this success has affected the deterioration of forest and other natural resources. Illegal clearing of forested lands has been extensively performed by the villagers who want these

lands for those agricultural crops. Some lands may not be suitable for cultivation at all and have caused various problems to soil and water conservation as well as forest development plans.

Several attempts have been made by the government to improve this situation. These have included various projects concerning soil and water conservation, agricultural extension, irrigation development, forestry development, land development, land allocation, and land settlement. Most of these projects have been carried out in the rural areas of the country. However, the progress of these projects have not been satisfactory because of several obstacles. One of the obstacles is the lack of necessary knowledge and awareness concerning natural environment of the general population. It is for this reason that environmental education is desirable.

CHAPTER III

APPROACHES TO ENVIRONMENTAL EDUCATION IN THAILAND

I. GENERAL CONCEPT AND PHILOSOPHY

The Nature of Environmental Education

Environmental education involves a great range of concepts. There are some people who think it is a new version of science education. Some think it is an expanded version of conservation education while others think it is outdoor education. There are also those who think that environmental education is the constructive use of field trips to national landmarks, to environmental study areas, and to the countryside to tie together nature, history, and appreciation of their heritage. These have been considered by Smith and colleagues (39:26) as environmental education being a little of everything poured into an educational pot.

They (39:26) feel that environmental education seeks to broaden the concept of ecological relationships of the physical and biological environment. It attempts to see man as a part of the total environment rather than an organism on the outside looking in. It sees man as the major decision-making factor in the ecological mix.

There are several educational experiences that inspire humans to seek behavior promoting an improvement in the quality of the physical environment. Some of these experiences are associated with subject

areas such as science and social studies. Others are concomitants of skills and outdoor sports such as hiking and hunting. Many concepts and attitudes are developed in the classroom while others may be achieved more effectively in the presence of natural resources. The content of environmental education includes the total environment of man—the biological, social, economic, cultural, ethical, and aesthetic components of the environment.

A completely acceptable definition of environmental education has not yet been established, for it is a relatively new activity and is still undergoing important developments in its practical application and theoretical foundation. Bogan (8:1), in his attempt to define the term environmental education, indicates that it is the process that fosters greater understanding of society's environmental problems and also the process of environmental problem solving and decision making. This is accomplished by teaching the ecological relationships and principles that underline those problems and showing the nature of the possible approaches and solutions.

That is, the process of environmental education helps the learners perceive and understand environmental principles and problems, and enables them to identify and evaluate the possible alternative solutions to these problems and assess their benefits and risks. It involves the development of skills and insights needed to understand the structure, requirements, and impact of interactions within and among various environmental entities, subsystems and systems.

Nevertheless, the goals and objectives of environmental education which are developed by various educators seem to be very similar.

Hawkins (18:194) pointed out that the ultimate goal of environmental education is to develop the individual's awareness of his environment that will lead to a personal sense of involvement and eventually to the shaping of an environmental ethic to guide his behavior.

Roth (33:48) has stated a similar goal in environmental education which is to encourage the individual to develop the ability to make thoughtful decisions which will create an environment that allows him to live a quality life. He indicated that in order to acquire this goal, environmental education is seen to be concerned with developing a citizenry that is:

. . . Knowledgeable about the biophysical and sociocultural environments of which man is apart. . . . Aware of environmental problems and management alternatives of use in solving those problems. . . . Motivated to act responsibly in developing diverse environments that are optimum for living a quality life (33:48).

These objectives were accepted by Dr. William B. Stapp as he concluded that:

The major goal of environmental education is to produce a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (40:235).

Thus, it can be seen that environmental education is concerned with knowledge of the universe, society, and the individual. It does not only attempt to provide the individual with environmental understanding but also views him as a potential creative being. It encourages him to accept the responsibility of decision-making which is his by virtue of being human.

Since environmental education is not just ecology, conservation, outdoor education, sociology, or art appreciation, an interdisciplinary focus is required that embraces the social sciences, humanities, science and technology in like measure for purposes of developing cognitive understanding, belief and attitude change, and providing motivation for behavioral change and action. These are to help individuals gain:

A broad understanding of the environment, both natural system and man-made, and its role in contemporary society. . . . A clear understanding that man is a central and inseparable part of the complex environmental system and that he has the ability to alter the interrelationships of the system. . . . A fundamental understanding of environmental problems confronting man, how these problems can be solved, and the need for individual citizens and government agencies to work toward their solutions. . . . Attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environment problem-solving (18:194, 40:235).

Applications of Environmental Education

There are many educators who, in recent years, have directed their attention to the application of environmental education. Following are some concepts and philosophies which have been accepted very widely in the United States. Hawkins (18:194) suggested that environmental education programs be educationally sound, relevant to the needs of students, and supported by citizens in the community and professional personnel in the schools.

Hendee (19:20) pointed out that environmental education programs should aim first at transmitting knowledge and facts and, subordinate to that, at changing attitude, values, and cultural perspectives toward the environment and stimulating social action. Thus, the suggested

objectives place premiums on facts and information, development of citizen ability and resolve to bring about effective social action.

Rillo (32:53), in his attempt to formulate some basic guidelines for environmental education, stated that education should not ignore the citizen who has finished formal education and is interested in how he can participate in effective environmental action programs. Environmental education should extend from childhood through adulthood and be instituted into appropriate formal and informal programs. Teachers, youth, group leaders, conservationists, recreationists, camp leaders, church leaders, and others who work with youth or adults need to become prepared in environmental education leadership. He (32:54) recommended that environmental education be organized into two major approaches. The first approach should involve the private and public school sector where the greatest segment of population is to be found in one place at any given time. The second approach concerns itself with adult population and involves a variety of agencies, institutions, and information dissemination centers. Thus, environmental education may be classified into two major categories, in-school education and out-school education. In-school category concerns development of curricula, component elements, in-service teacher training, and other related activities. Out-school deals with development of environmental study areas and facilities, services and activities concerning other agencies as well as general population.

The necessity of introducing environmental education into school system is beyond doubt. As it has been done in many countries, most efforts in development of environmental education program have focused

on an integrative, curriculum-spanning approach. The focus is on linking those subject elements, which relate most closely to the environment, into the school curriculum. Following are the general guiding principles in development of environmental education programs which were suggested by Dr. William B. Stapp:

Span the curriculum, kindergarten through the twelfth grade so that environmental experiences can be presented at every grade level, thereby capitalizing on the cumulative effects of the program. . . . Link subject areas that relate most closely to the environment, especially science and social studies, so that both the social and scientific knowledge important in understanding and solving environmental problems are properly developed. . . . Integrate and correlate the program with the existing curriculum in a manner that will enhance the instructional goals of the school systems. . . . Focus on the local environment, but do not neglect regional, national, and international environmental issues. . . . Stress attitudes and problem solving skills. The most important environmental impact that most of urban citizens will have upon environment is through their action as community citizens. . . . The learner should play an active role in the learning process. The learner develops attitudes through personal experiences and thinking and not through the presentation of predigested conclusions. . . . Provide a comprehensive in-service teacher education program which would operate throughout the school year and which is directed at assisting teachers to increase their understanding, interest, awareness, and teaching skills in environmental affairs and to involve them in curriculum development (40:236-237).

The next question in developing an environmental education program is how to introduce these environmental encounters practically in the school. The solution of this problem has been suggested by Galushin and Doraiswami as following:

Environmental topics may be dispersed through the entire or major part of the school curriculum by insertions in the course plan of various subjects.

A specially designed nature-conservancy unit may be a chapter or section within the framework of one of the existing school subjects.

An integrated course of environmental conservation as a separate discipline, equal to other school subjects, may be offered (13:10).

Nonformal education will reach important segments of the general public with environmental education programs. This will be a major responsibility of local and national media, government agencies, volunteer agencies, business and industry, and other private organizations.

It is essential that both local and national television, radios, film studios, newspapers, magazines, and book publishers contribute increasingly to informing the public about environmental problems and their possible preventions and solutions. In addition, the vast advertising and promotional resources of business and industry may be directed toward environmental and ecological issues.

Several government and volunteer agencies receive cooperation from school personnel and their facilities for full utilization of the programs and activities these agencies offer. In addition, museums and libraries frequently arrange for special exhibits, films, or discussions of interest to general or special groups.

II. APPROACHES IN DEVELOPMENT

The necessity to introduce environmental education in Thailand is unquestionable. Rapid growth of the population and misuse of natural resources have apparently compounded environmental problems in the country. The majority of the population in Thailand seems to be unaware of the nation's environmental crisis and continues to deteriorate their natural environment. It is necessary to create an environmental awareness which will motivate people to participate in environmental problem-solving. This awareness needs to be adopted by the general

population and especially by younger generations. This will be done through environmental education.

In order to achieve the above goal, educational approaches to environmental development in Thailand should be carried on both in-school and out-school. In-school or school-oriented educational approaches deal primarily with school curriculum (formal education) and students' activities within school (informal education). In-service teacher training programs are also included in this category. Out-school or nonschool educational approaches concern other environmental education activities and facilities which should be provided by other government and volunteer agencies.

School-Oriented Educational Approaches

Environmental education within this category concerns the educational action which is related closely to school. It involves school curriculum, and activities resulting from the relationship between teachers and students through educational process. In Thailand, school is always the primary source for young people to acquire knowledge and develop their attitudes as well as skills. Therefore, environmental education for young people in Thailand should aim first at schools. Under Thai school administration, formal education is seen to be the most appropriate way to furnish the young generation with positive attitudes towards their environment.

There are also some other activities which are organized or operated voluntarily by schools or teachers and have helped create skills and motivation among the youth. Boy scouts and Yuwa Kasetkorn works are

among the fine examples within this category. These activities may not be included in the school curriculum but are linked closely to school. It is the teacher who works voluntarily as a leader, and the student in school who make the programs work. However, environmental education may not reach its goal if teachers lack proper training. It is imperative that in-service teacher training programs be developed to help the teachers increase their understandings, interest, awareness, and teaching skills in environmental education. This will help the teachers work more effectively in preparing Thai youth with proper attitude toward their environment.

Formal education. The formal education system, from elementary school through continuing education, will directly affect more than 50 percent of the Thai population within this decade. For this reason, it is vitally important for the school in Thailand to provide a comprehensive environmental education program through its formal education. The program should be aimed at helping Thai youth to be more knowledgeable concerning the environment and associated problems, aware of how to help solve these problems, and motivated to work toward their solution-making.

The challenge for formal education is the establishment of curricula with relevant environmental contents, presented in a way to meet the present high motivation of students. This means that it must take advantage of all opportunities to relate learning experiences to actual environmental awareness and decision-making in the community.

Various approaches to the solution of the above challenge have been suggested in several respects. However, these approaches can be roughly grouped into three areas. The first approach, referred to as the "topics" approach, is to infuse environmental and ecological topics into course plans of various subjects. Under this approach, topics concerning environmental information may be dispersed through the entire or major part of school curricula. These topics are continuously introduced into many subjects which lend themselves to developing the student's attitude toward environmental awareness. The second is called the "chapter" approach and involves the development of a specially designed environmental chapter and the introduction of this information into existing subjects. The third approach, described here as the "integrated" approach, entails the integration of environmental education as a separate subject or discipline into existing school curricula.

Each of these approaches has its advantages, disadvantages, and differences. The chapter approach differs from the topics approach in that while individual chapters provide more depth than do individual topics, chapters are usually introduced into a specific subject one time, while topics are infused into the subject on a continual basis. Hence, the topics approach is a more subtle method of introducing environmental education, but lacks depth that is sometimes necessary. In addition, the topics approach allows no opportunity to integrate environmental elements and to eventually develop an environmental philosophy.

The integrated approach involves the development of at least one new subject, perhaps called "Environmental Education," and provides more

depth than do either of the other approaches. It is seen to be the best way to describe, and make students aware of, environmental considerations.

Given that Thai school curricula are already crowded, the more time any approach may take to implement, the more difficult is the task of doing so. The implementation of the integrated approach requires at least thirty school hours to cover these subjects within the course. Given the present structure of Thai curricula, this approach may not be desirable in some cases. On the other hand, the "topics" approach requires little time to implement if developed properly. The "chapter" approach is somewhat of a compromise between the two approaches just described.

In order to introduce environmental education into the educational system in Thailand, these three approaches should be treated as successive stages rather than alternatives. The first stage, "topics" approach, is the easiest to implement and seems to be most suitable for elementary education. The second stage or "chapter" approach is a compromise between the first and the third stage and is suggested for secondary education. The third stage, which is considered the most effective, is the "integrated" approach and is more applicable for higher education. However, each approach should not be considered to be restricted within a particular level of education. These approaches can be manipulated when the situation suggests doing so.

Elementary education. The "topics" approach is seen to be the most suitable for elementary education in Thailand. The elementary school curricula have always included topics concerning environmental education in biology, geography, and other related subjects. However,

these topics seem to be limited and concerned to nature study rather than environmental education. The urgent need is the revision of those topics to bring them up to date and be more concerned with environmental education. Also, other new topics which will complement environmental education should be developed within other subjects as well.

The range of topics should cover these three areas: natural resources; interrelationship of resources; and role of human in using his resources. Following are examples of topics concerning natural resources:

1. Air
2. Water
3. Plants
4. Animals
5. Soil
6. Land as space (farm, range, forest, towns, cities, transportation, recreation)
7. Earth materials
8. Energy resources (the sun, fossil fuels, water power, atomic energy, etc.)

Emphasis in the elementary grades should be centered on developing appreciation of nature, awareness, interest, understanding, and respect for the environment. Some basic skills and processes of science, e.g. use of senses and measurement, should also be developed for the student at this level. The student should be stimulated to see the variations in different communities, search for examples of possible relationship

between one species of animal and another, between plants and animals, between plant species, and between living things and their physical environment.

School site or nearby environmental community is a very good outdoor classroom for the students to learn about their environmental quality. With outdoor classrooms and environmental topics combined together, students in the elementary classes will be able to use inquiry skills to explore almost every facet of man's interaction with their biophysical and social environment. They will be able to gain a clearer, more unified and better related understanding of the environmental world.

Secondary education. There are two main branches of secondary education in Thailand, academic and vocational secondary. There are lower secondary classes and upper secondary classes for each of the major branches. There is not much difference between the major branches for the lower secondary classes. The distinction begins mainly at the upper secondary classes. The upper academic secondary prepares students for education in the universities or higher institutions while the upper vocational secondary aims at developing of professional skills for students in particular areas.

The implementation of environmental education for the secondary classes has been done on the same basis as those of elementary classes. This effort may be classified as the "topics" approach. Indeed, there is also various information concerning environmental awareness within some basic science subjects that have been introduced to the secondary classes.

As far as the present situation is concerned, it is seen that young people in Thailand need more knowledge and skills toward their environmental quality. Infusion of environmental topics (the first stage) in the secondary school curricula by itself has already shown that it is not enough for the present state of technology and human activities. The attention should be directed to expanding and developing of the next stage, the "chapter" approach.

The most important consideration in the development of the "chapter" approach is that of developing a special section or chapter concerning environmental study within the existing school subjects. Biology and geography are seen to be the main subjects to be considered for this purpose. It is much easier under the existing circumstance to achieve a partial revision of these courses than to carry out a reform of entire school curricula. In addition there are few biologists, geographers, or curriculum planners, whose objective is to incorporate environmental education into their subjects. The special chapter should be organized well enough to sum up the necessary knowledge into a coherent whole. As an example, a special chapter named "Conservation of Nature" might be developed. It should contain the following main themes: vital importance of conservation of nature for the existence of life; management of natural resources; conservation of soil and water, forest, and wildlife; the global role of the green cover; and national and international efforts for effectiveness of environmental conservation.

Following are some other suggested chapters concerning environmental education which should be considered and developed through school subjects of the secondary education system in Thailand.

Ecology. Here the concepts of ecosystems, communities, energy flow, and balance of nature, need to be emphasized.

Agriculture. The nature of agriculture, food production, and elementary concepts of agriculture should be discussed.

Pollution. Effects of pollution on air, water, land and health, and the nature of various gaseous, liquid, and solid wastes should be dealt with. An introduction to the toxicology of wastes and pesticides should be included. Exploitation of wildlife, fisheries, and forest should be discussed. The question of how pollutants are formed and circulated should be raised.

Population. History and explanation of human population growth, population analysis, control of population, birth control, family planning, food and nutrition, and population problems should be covered.

In addition to these chapters, material from other school curricula needs to be added to help develop skills and learning experiences for secondary students. Some basic skills and processes of science which they have learned from the elementary classes should be integrated with more degree of complexity in the upper classes. Beginning with processes such as description or observation at the lower elementary classes, the student in the upper classes should have some experiences of experimentation and evaluation. Also, greater independence in finding and using sources of information is desirable for the student in the secondary education. These skills and learning experiences will provide them with proper attitude and decision-making toward their environment in the future.

Environmental education at the elementary and secondary level will be the most important stage in complementing environmental awareness for young people in Thailand. This is due to the fact that the majority of Thai people do not continue their education beyond this level. They usually drop out of school before completing secondary education. For this reason, only during this period of school time can formal education provide a majority of Thai people with proper knowledge and learning experience towards their environment.

The organization of either the "topics" or the "chapter" approach and the learning experience for the student within both levels must incorporate considerations such as child development, interest, logical structure of disciplines, the nature of learning, attitude development, facilities, social context, and teacher preparation. In actual curriculum development, such considerations are highly numerous and detailed. Furthermore, since curriculum development is a continuous process, content and organization will undergo more or less continuous change.

However, this change may be supported by establishing certain objectives within each level. In the elementary classes, objectives should be directed at developing awareness, interest, understanding and respect for the environment; enjoyment in interaction with environment; appreciation of natural beauty; and satisfaction in harmony with nature. Emphases in the secondary classes should aim at developing a sense of need to improve environmental concern; desire to achieve constructive solutions; effective use of senses and processes of science; capability

in finding and using sources of information, proper decision making and planning; and other processes and skills.

The areas of objectives as organized for both levels should not be taken as mutually exclusive or strictly sequential. Evaluation as a skill may be taught in the elementary level, but it should be emphasized at the secondary level. Hence, the organization of environmental content should not be seen as strictly sequenced, but an overall pattern does emerge.

Higher education. Motivation of the students at higher education institutions in Thailand towards environmental development has not reached an acceptable level. Lack of awareness and interest are among the major obstacles. It is at this level that the integrated approach is seen to be the proper tool in implementing environmental education.

Although various courses concerning environmental education have been integrated in some higher education institutions, they have been directed towards professional skills in particular areas such as forestry, fishery, or agriculture. There are only a few courses in other Departments or institutions which aim to create awareness, interest, and understanding for the student at this level and to motivate them to take action in complementing environmental development. It is necessary that this type of program be integrated in every higher education institution in Thailand.

The so-called environmental education program to be integrated within higher education should cover the following main themes: defining environmental problem or issue; becoming informed about the problem;

stating alternative solutions; developing a plan of action; and implementing that plan.

More emphasis should be made through the Education Department within higher educational institutions and Teacher Schools in providing expanded and improved programs in environmental education and requiring that some courses in this field be studied by all prospective teachers, along with expanded summer programs for experienced teachers. Schools should also provide sufficient environmental study areas and facilities for their students. Use of environmental study areas provides actual environmental experiences and encounters and allows students to apply what is learned in the classroom to real life situations. The effective content and activity provided by the higher education institutions will certainly help students increase their awareness, interest, and understanding of environmental quality. This will motivate them to take action in preventing environmental deterioration as well as to work towards the proper solutions and development.

Informal education. Environmental education within this category includes the activities which are school-oriented. The activities may be performed either in-school or out-school but are related closely to school, school teacher, and student. Without school as a communicational media, these activities may not be recognized, neither by youth nor adult in the community. It is teacher and student who play the important role. Following are some educational approaches to environmental education which should be developed through school-oriented youth organization in Thailand.

Yuwa Kasetkorn. The agricultural extension officials and local volunteer leaders have done an acceptable job in developing Yuwa Kasetkorn work in Thailand. This is proved by the number of clubs and club-members which are increasing every year. However, many projects which have been introduced to the members have not been developed far enough to cope with the present problems of the country. Most of the projects are agricultural in nature and usually involve animal raising and food crops. The other project area is home economics which has been conducted for only a few years.

Development of a new project concerning environmental awareness is the most appropriate approach to Yuwa Kasetkorn members. The project activity may be introduced under the title "Community Awareness and Development." The Community Awareness and Development project involves helping the group members to discover their community and encourage them to take action in improving the quality of their environment. There are some principal objectives which need to be included. These are: (1) to have youth learn about and understand their community and the impact it has on their life; (2) to have youth know how to relate, individually and through groups, in order to work effectively in community activities, programs, and organizations; (3) to have youth develop knowledge and skills in community leadership; (4) to have youth gain actual experience in carrying out meaningful community projects to improve their surrounding environment; and (5) to have youth develop an interest in and love for their community.

Emphasis within the Community Awareness and Development project would vary from community to community depending upon the local

conditions, need and interest of the members. These subprojects should include soil and water conservation, forestry, wildlife, resource development, and other community development concerning environmental improvement. The subproject is important but even more so is the situation created by members in which they explore, learn, share concerns, and build mutual trust and confidence in each other so they work together.

Boy Scouts. Scout programs will be a good tool to get Thai youth in closer relationship to nature, especially forestry, wildlife and other natural resources. Since the Boy Scouts programs are integrated as a part of school curricula, it is a good opportunity to include some activities regarding environmental education experience within the scout programs.

The training programs for scouts in Thailand have always been designed to encourage each scout to be self-reliant, to have initiative, and to develop a resourceful mind. Under these circumstances, it is easy to develop some contents or activities within scout programs with more concern toward environmental development. These contents should be developed and organized in ways to increase his understanding, aesthetical and ethical values, and respect of the natural environment; his awareness about ecological crisis; and his responsibilities in environmental development.

Emphasis at the Cub Scouts level should be centered at developing appreciation of nature. This may be initiated through outdoor recreation and education activities. Some basic skills in observation or identification of surrounding environs should also be developed for the

Cub Scouts. These skills should be developed as a continuous process with more degree of complexity at the Boy Scouts level. Camping experience and forest recreation should be among the main related learning experiences for the Boy Scouts. Necessary consideration should be made to increase the interest and responsibility of the scouts at this level toward the environmental improvement. Emphasis at the higher levels, Senior Scouts and Rover Scouts, should be directed to develop leadership and responsibility in taking action of preventing environmental deterioration and developing environmental quality.

The Cub Scouts and the Boy Scouts account for more than 90 percent of the total scouts in Thailand. Therefore, it is necessary that most of the environmental education experiences should be initiated through these two levels. These learning experiences, together with scout training systems, will help create appreciation and better attitudes towards natural environment among the scouts and will motivate them to responsible actions intended to result in general or specific betterment of their surrounding environment.

In-service teacher training program. In-service training programs for teachers are one of the most important aspects of the environmental education program in Thailand. Only a few teachers have been trained in the colleges and universities to use the community environment or nature study areas to enrich instructional goals in environmental education. For this reason, it is vitally important in the establishment of the program and in its continuation to provide a comprehensive in-service training program for teachers. The training program should

be directed at helping the teacher increase his awareness, interest, understanding, and teaching skills of concerning environments. This would help the teacher work more effective in helping Thai youth to acquire skills and knowledge essential in contributing to the solution of environmental resource problems.

The in-service training program for teachers should be multipronged, so that the teacher receives training in a variety of ways throughout the school year. These training varieties may be categorized into three stages. The first stage of the in-service teacher training programs would be to orient all teachers and administrators to the philosophy of environmental education, structure of the environmental education program, and ways to effectively utilize environmental encounters. The second stage would be to plan a bus excursion in the environs of the community to provide teachers with firsthand experiences regarding their local environmental and associated problems. All teachers should be informed of community citizens and governmental officials that are knowledgeable about the environment and available to serve the school system as resource persons on environmental matters. The last stage of the in-service teacher training programs would be to assist the teachers in ways to effectively develop subject matter and activities, concerning environmental education, into the school programs.

If Thailand is to bring its citizens to a fuller understanding of their environment, the schools must embark on a comprehensive in-service teacher training program concerning environmental education. This program should aim at helping teachers increase their awareness, interest, and understanding of their environment, as well as their

responsibility to help solve environmental problems. The program will certainly assist teachers in acquiring the skills and knowledge necessary in guiding Thai youth they serve.

Nonschool Educational Approaches

While the school is children's basic education agency, environmental education should be a continuing process. It should take place through the home, mass media, study areas, and various public and private organizations. These types of educational actions can most effectively bring the elements of their environment and the total ecological system to the attention of the people of Thailand. This can be accomplished by developing and implementing a nonschool educational approach or so-called general information program. General information programs could be extremely valuable to Thailand in creating awareness and motivating people. These programs can be so designed that the people may not be aware that they are being educated in the wise use of natural resources.

In order to achieve the environmental education goal, the programs must be operated and applied by various public and private agencies. Due to the limitations of this study and sources of information, the following development programs will be more concerned with forestry and natural environments. The Royal Forest Department is the main agency which would be responsible for the programs but with close cooperation with other related agencies.

Public service. Public service is one of the most important areas in providing environmental education for the entire population. With the proper public services provided by the Royal Forest Department,

Thai citizens will have greater opportunity to acquire knowledge, understanding, experience, and appreciation. These will help create positive attitude toward forest resources and the entire environment. The services may operate through the following programs: park and recreation service; office service, and special service.

Park and recreation service. Four national parks have already been established and ten more are to be ready soon. In addition to the national parks, smaller forest parks (18 in all) have been developed in different localities spread over the nation. They are usually places beset with beautiful nature, scenic landscapes and picturesque cliffs and waterfalls. There are also 12 arboreta created in various places throughout the country. The main service of those parks and forest recreation areas has always been to provide aesthetic satisfactions through the maintenance of the areas, either natural or horticultural. It is necessary that education-oriented service be emphasized more in those parks and forest recreation areas. To achieve this objective, special services and necessary facilities such as interpretive services, exhibits and displays in place, museum or interpretive centers, trails, and free or low cost publications should be furnished and made available for the visitors in these areas.

When the need for forest recreation areas increases in the future, more parks and forest recreation areas should be developed in places of beautiful timber stands, plantations and scenic streams in the forest areas. These efforts will result not only in better public relations but also in good education experiences. They will help create

appreciation and respect for the forest environment as well as for the Royal Forest Department.

Office service. Most of the office service concerning environmental education has been done through public relation programs by the central administration, the Royal Forest Department. Education-oriented services at the territorial administration offices are less concerned due to a lack of interest by both the officials and rural people. It is necessary that the Royal Forest Department develop more education-oriented services in its existing public relation programs and encourage that these programs be taken by its territorial administration officers.

Assisting schools with comprehensive services in environmental education is one of the most needed programs. The program should aim to give direct service in education which relate to forest resource use. More encouragement has to be made to stimulate school administrators and teachers to use the services and facilities provided by the Royal Forest Department and other territorial offices. The forest museum at the Royal Forest Department is more likely to be a central office to provide information, guiding, and services to schools in Bangkok as well as in rural areas. Also, a lot more work has to be done to develop and improve the museum to make it ready for these services. It is necessary to have a program coordinator who can make services available for schools or other organizations. This will assure that good cooperation is provided by the Royal Forest Department. The program coordinator will also help provide personal appearance programs or other

mass media education programs for schools as well as other organizations such as Boy Scouts or Yuwa Kasetkorn.

Other educational aids such as printed materials should be available for visitors in order that they can expand and pursue their education from these materials. These materials should also be available at the territorial administration offices as well as at the parks and forest recreation areas.

Special service. Some special services such as interpretive service and public field trips have contributed a great deal of attention to environmental education in the United States. Thailand has no experience with these types of service before. Therefore, it is necessary for Thailand to study the applicability of these types of services to the Thai situation. If these special services were to be adopted, they should become a part of the Royal Forest Department, and developed through interpretive services, environmental study areas, and public field trips.

Interpretive services will be a big contributor to environmental education for the visitors who use parks and forest recreation facilities. The service should help each visitor to see himself as part of his surroundings and to recognize his importance and individual responsibilities. The whole interpretive offering should be centered on people and their surrounding environment. The program aided by the resources of park lands should be designed to provide a wide variety of opportunities for inspiration, knowledge, and skills so as to assist each visitor in attaining the following general goals: (1) appreciation for the immediate surrounding; (2) an understanding of his place in the

broad environmental picture; and (3) activities in which he can participate to keep his community attractive and to develop environmental quality.

Special interpretive services should be developed for school groups and youth agencies. The programs should imply more education. Day or half-day visits by school classes may be used for field trips with the interpretive staff, viewing museum exhibits, participation in observation, hearing illustrated talks, or watching slides or movies related to the local area. In some cases the interpretive staff should visit school classrooms to conduct discussion sessions, give talks, and show pictures or exhibits. The special interpretive services will provide a great help to school teachers and local volunteer leaders in helping conduct their environmental education programs.

Providing environmental study areas for schools or youth organization is another special service that needs to be made available by the Royal Forest Department. The program should be developed with close cooperation between the Faculty of Forestry, Kasetsart University, and the Royal Forest Department. Three forestry study centers have already been established by Kasetsart University for its forestry students to practice during the Summer. These centers are also used by the Forestry School of the Royal Forest Department. With close cooperation by these two agencies, these study areas and facilities can be developed and made available for local schools to use and conduct their environmental education programs.

There are also numerous experiment centers and plantation stations of the Royal Forest Department scattered in the different localities

throughout the country. These places can also be developed and made available for local schools to use as environmental study areas for their students and teachers. Use of these study areas will provide actual environmental experiences and encounters and allow students to apply what is learned in the classroom to real life situation.

The environmental study area is designed to serve everyone in a community, although the majority are young people. It seeks to acquaint young people with the mysterious and wonders of the environment, a task that is becoming more difficult with the relentless destruction of native habitats. It affords young people an opportunity to engage in activities that are both constructive and educational. It also provides a training ground for youth who wish to become scientists. The area can be a significant outdoor laboratory for students as well as teachers. Adults can utilize its facilities and resources for serious study and pursuit of hobby interest. A study area is also a place where a man can take his family for a walk to see a natural environment. A well-planned and carefully-developed environmental study area will not only serve a very useful education purpose but will also stimulate interest and support for similar facilities in other areas.

Occasional field trips provided by the Royal Forest Department will complement environmental education. Since the Department has taken over most of the forested areas, it is easier to conduct various types of trips to those areas. Such trips may be general in nature, intended to acquaint participants with the components of natural environment. Trips may be taken to particular locals, such as a special nature formation, a historical site, a wildlife refuge, or a new forest recreation area.

Otherwise, the trips may be intended to acquaint groups with a particular subject of interest, such as trees, wildlife, rocks, or local history. Special trips can be conducted for groups in special occasions such as reforestation project on Arbor Day or environmental development actions.

Personal and mass media communications. Activities under this topic have been conducted primarily by the Royal Forest Department for good public relations. However, these activities should be revised and developed to complement not only public relations but also environmental education.

Personal appearance programs. The big advantage of personal appearance programs as a communication method is the directness, the atmosphere of reality, and questions which can be asked and answered immediately, resulting in two-way communications. No other medium or method can replace direct contact when great clarity, understanding and impact are needed.

Attempts to influence the public should not be too obvious. If it is possible to entertain as well as educate and motivate, the designed goal will be attained more easily. Many people attend a meeting or talk to be entertained, to see a series of slides or a motion picture. They must be educated and motivated along with the entertainment.

As part of the Royal Forest Department, personal appearance programs will be the potential tools in helping Thai citizens create proper attitudes toward forest resources. More encouragement can be made by its forestry officials, at the territorial administration offices, to participate in these programs. The emphasis would be directed at

schools, youth organizations such as Boy Scouts or Yuwa Kasetkorn, and other group activities. However, the Department must provide enough materials and facilities such as printed publications, slides or films for those officials who conduct personal appearance programs.

Printed publications. The importance of printed publication has continued to increase even with the advent of new mass media devices such as radio or television. Printed words can be considered the foundation of other communicated methods. Speeches, radio programs and television efforts are usually composed upon paper before being produced in the final ways. The advantage of written communications is that reading is habit-forming. Also, the printed message, in the printed message, in the newspaper, magazine or other sources, can be used by the reader at his convenience. Printed messages can be read any time after being published and can be saved for a permanent record.

Much more effort is necessary by the Royal Forest Department to implement this program. The first thing to be improved is its library. Newer and more books, as well as facilities, need to be furnished in the library. The library should be improved so that it is able to supply proper and up-to-date information and printed material for not only its officials but also outsiders. The improvement of library and its facilities may result in more printed messages concerning forestry or forest environment in the newspapers and magazines. In addition, other attempts by the Royal Forest Department should be made to encourage its officials in writing printed messages concerning forestry as well as natural environments for the benefit of the public.

The only magazine of the Royal Forest Department, the Vanasarn, should be improved to attract more attention from the general public. This improvement should also include other printed materials which are published by the Department such as annual reports, research reports, pamphlets, brochures, and posters as well.

Radio and television programs. Radio is the most widely accessible of all mass media. It has the ability to disseminate information to the largest number of people in the shortest time. The magnitude of the audience reached by radio is great and the amount of effort expended per person contacted is small when compared with other mass media. Radio has the advantage of being personal and available. Almost every family in Thailand has a radio receiver. Radio programs have been used very extensively in agricultural extension. Such programs can be applied and developed for the similar purpose in the areas of forestry and related environmental education.

Television will be used more and more by the Royal Forest Department to further necessary objectives of education and to promote better public relations. It will influence the public, particularly in urbanized sections of the country. Intensive use of television programs concerning forest resource uses, forest recreation, and wildlife management are seen to be a great implementing force to environmental education. More cooperation by the television networks in presenting slides or moving pictures concerning forestry and the environment should be sought by the government. This should also include attempts by the government and television networks to show more

movies which create forestry appreciation and environmental awareness as well.

Miscellaneous communication methods. In addition to previously suggested personal appearance programs and mass media methods of communications, there are many other ways to contact and influence youth and adult that really do not fit either of the two categories. Displays and exhibits can be used very effectively at the local fairs. To be successful, the display or exhibit must be more than oddity. There should be a story or lesson present, in addition to attracting attention and entertaining the viewers. Promotion of special contests is the other method to be developed in complementing environmental education. Composition-writing contests have been carried out successfully by the Royal Forest Department. There are many other contests that can be developed to attract more attention from the youth and general population. These contests may be conducted through particular activities of Boy Scouts, Yuwa Kasetkorn, or other adult organizations.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Misuse of the natural resources by man has led to many environmental problems. In response to those problems, man will eventually have to acquire the necessary tools to help ease the situation. Environmental education is one of these tools which promises to help increase interest, awareness, and knowledge concerning environmental protection.

The necessity to initiate environmental education to the people of Thailand is beyond doubt. The explosion of its population is the primary factor that has caused several environmental problems. Misuse of natural resources is another factor which directly affects environmental deterioration. Acceleration of the country's economic development activities has resulted in increasing environmental deterioration. It has been the purpose of this study to develop some generalized approaches to environmental education to Thailand.

Thailand has more than 34 million population. The annual rate of population growth is about 2.7 percent. Thai people are described as religious, conservative and having preference for the communal village life. Agriculture is the main occupation of Thai people. Over 80 percent of Thailand's work force are engaged in agriculture.

Thai society is highly centralized. Bangkok, the capital of the country, is the center of the society. Youth movements have not met with much success due to a lack of recognition from the general

population as well as funds and people who work voluntarily for the organizations. Only organizations sponsored by the government seem to be successful since they have sufficient funds and volunteer people to conduct the clubs. Boy Scouts of Thailand and Yuwa Kasetkorn are among the examples.

The economy of Thailand has been based on agricultural production. Agriculture accounts for more than 30 percent of the national domestic product. When compared with total domestic exports, this number increases to 70 percent. However, its relative importance to the national domestic product has been declining in the recent years. This indicates an advance of industrialization in the country.

The first National Economic Development Plan, which was activated in 1960, has encouraged the economic development of the country. The economy of the nation as a whole has been improving. However, this improvement may be at the expense of natural resources. Lack of effective resource-use planning and rapid growth of the population have resulted in several misuses of natural resources. Misuse of natural resources have directly caused environmental deterioration. Several attempts have been made by the government to control resource deterioration. These measures have included various projects concerning forestry development, agricultural extension, land development, soil and water conservation, rural development, pollution improvement, and education development.

The education system of Thailand can be classified into three levels: elementary education, secondary education, and higher education. Compulsory education begins at the elementary level. The majority of

Thai children usually drop out of school after they finish compulsory education (grade 4).

Once the environmental education components concerning Thailand are identified and examined, it is necessary to review some general concepts and philosophies of environmental education in order that the suggested approaches to environmental education would be logically sound and best suited to the Thai situation.

The approaches which have been presented in this study have been designed into two categories: in-school or school-oriented educational approach and out-school or nonschool educational approach.

The school-oriented educational approach deals primarily with school curriculum (formal education) and students' activities resulting from the relationship between teachers and students through the educational process (informal education).

The formal education system, from elementary education through continuing education, will directly affect more than 50 percent of the population of Thailand. The principal effort in environmental education should be that of developing supplementary materials that are designed for school curricula. In addition, the development of new curricula applicable to nearly all teaching and learning situations should be initiated.

Three stages in development of environmental education programs within school have been suggested. The first suggested approach is to infuse environmental and ecological concepts into course plans of various subjects in elementary school curricula. The second approach for school systems is that of developing a specially designed environmental

unit within the framework of traditional subjects for the secondary education. The third approach is to integrate a new course of environmental education as a separate subject in higher education.

In addition to these approaches, other educational activities, such as Boy Scouts and Yuwa Kasetkorn programs, are also important contributors to the development of environmental education for Thailand.

The formal and informal education toward environmental concerns may not achieve its goal if teachers lack the necessary knowledge and skills to conduct environmental education programs. For this reason, it is necessary that a comprehensive in-service teacher training program concerning environmental education be developed for the teachers in Thailand. The program should be developed in ways to help teachers acquire necessary knowledge and skills in teaching environmental education.

Nonschool education will reach important segments of the general public through environmental education programs. These programs should be operated and applied with close cooperation by various public and private agencies. Among these agencies, the Royal Forest Department will have a major responsibility of making its resources available for the general population to pursue their environmental education.

The environmental education movement in Thailand has just started. Only a few studies and actions have been made which have complemented environmental education. Such complementation is seen to be one of the most important needs for Thailand under the present situation. Following are some recommendations which should be considered in development environmental education for Thailand.

1. A serious consideration should be directed to improve methods of implementing environmental education into the elementary and secondary school systems in Thailand.
2. A program providing in-service training for teachers is an essential ingredient for developing environmental education through the schools in Thailand.
3. Interpretive services which could be conducted by the Royal Forest Department would benefit environmental education and public relations.
4. Further study of research concerning environmental education development is vitally desirable.

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APPENDIXES

APPENDIX A

MAP OF THAILAND



Figure 1. Map of Thailand.

APPENDIX B

SELECTIONS FROM THAILAND'S ECONOMIC DEVELOPMENT PLAN WHICH RELATE TO NATIONAL FOREST POLICY

The text of the national forest policy as briefly stated in the National Economic Development Projects of the year 1961-1963 and to 1966, and proclaimed in the Government Gazette on October 20, 1960, is hereby quoted:

Thailand has an area of 320 million rai (625 rai = 1 square kilometre) out of this 60 millions rai are the agricultural land, and 187 million rai are covered with forests. There are about 20 million population who are dependent on this arable land for their sustenance and livelihood, about 13 percent of the above population or one million people are the landless farmers which also include the nomadic hill tribes who practise the shifting cultivation by reckless clearing of forests. The increasing in the production of farm crop is presently effected by means of the continuous expanding its cultivated area into the forest land. Couple with the illicit cutting of valuable tree species, the forest which help enriching the fertility of soil and are the sources of water and timber supply have been excessively destroyed to such an extent that will jeopardize the national economy as a whole. To remedy the deteriorating situation the nation-wide land classification to segregate forest land from the land which is suitable for agricultural purpose is the first step to be undertaken. This alienated land will be further allocated to the landless population which is about one million in number.

The land classification project is to be carried out in the following ways:

(1) The Departments of Land, Forest, and other related Departments have to jointly conduct the land classification through out the country. The objective of this project, at its beginning, is to reserve about 250,000 square kilometres or 156 million rai of forest (at present there are about 187 million rai of forest land). After the completion of the land classification project which should be within the next 6 years, about 30 million rai of arable land will be available for the allocation to the farmers.

(2) To reserve 156 million rais or 250,000 square kilometres of forests. Later on when the population is increased the reserved forests could be reduced to 125 million rais or 200,000 square kilometres, in which 100,000 square kilometres is classified as the watershed protection forest and the remainder is the productive forest. Within the next six years more budget will be allotted to the Forest Department for carrying out the forest protection, forest improvement, forest reservation, and reforestation.

However, the use of other types of fuel as lignite to substitute firewood should be encouraged in order that the forests can be indirectly saved from destruction.

(3) To allocate about 30 million rais of land to the landless people who wish to engage in farming. In future when there is more demand in agricultural land there will still be about 30 million rais of land in reserve.

The land classification and forest reservation projects are the national economic development project of the first priority and has to be completed within the next six years. However, the success of this project depends entirely on the close cooperation between the personnel of the Ministry of Interior and the Ministry of Agriculture, stationed in the central and the local head-quarters. The laws on land and forest will be amended in order that they will be more up-to-date and drastic, e.g. the penalty in the Forest Act should be amended with the aim to put a stop to the encroachment of State land. The reservation of forest is not the duty of the officers of the Forest Department only but the officials of other departments as well. Besides, the laws on the National Park and Conservation of Wildlife will be further promulgated.

The land on both sides of the newly opened roads or highways are to be allocated before they are being encroached. To carry out the above task, and to enforce the amended law effectively the officers concerned have to pay serious attention to the entrusted duties by having the above objectives as their guidance. Strong support and encouragement will be afforded to the forest inventory, forest reservation, forest improvement, and reforestation works as well as research work on forestry in order that the reservation and improvement of forests can be achieved within the six-year period of the Economic Development Project.

APPENDIX C

LIST OF NATIONAL PARKS, FOREST PARKS, AND ARBORETA

I. NATIONAL PARK

1. Kao Yai (Saraburi, Nakorn Rajasrima, Prachinburi, Nakorn-nayok)
2. Thung Salaeng Luang (Pitsanuloke)
3. Phu Kradung (Loey)
4. Kao Sam Roi Yod (Prachuab Kirikan)
5. Kao Phu-Pan (Sakol Nakorn)
6. Doi Suthep-Pui (Chiengmai)
7. Doi Inthanon (Chiengmai)
8. Kun Tarn (Lampang)
9. Larn Sang (Tak)
10. Kao Salorp (Kanchanaburi)
11. Nam Nao (Petchaboon)
12. Kao Sabarb (Chantburi)
13. Kao Kitchgoot (Chantburi)
14. Kao Luang (Nakorn Srithamaraj)

II. FOREST PARK

1. Mae-Sa Waterfall (Chiengmai)
2. Fang Hot Spring (Chiengmai)
3. Orb-Luang (Chiengmai)

4. Pa-Thi Cave (Lampang)
5. Muak-Lek (Saraburi)
6. Sarm-Lan Waterfall (Saraburi)
7. Dong Larn (Korn Kaen)
8. Sae Waterfall (Ubol Rajthani)
9. Prew Waterfall (Chantburi)
10. Kao Ka-Paw (Chumporn)
11. Ngao Waterfall (Ranong)
12. Kao Ta-Pet (Surajthani)
13. Kao Chong Waterfall (Trang)
14. Tone Sai Waterfall (Puget)
15. Boripat Waterfall (Songkhla)
16. Sai Kao Waterfall (Pattani)
17. Tarn Tow Waterfall (Yala)
18. Bajo Waterfall (Narativat)

III. ARBORETUM

1. Huay Chumpoo (Mae Hongson)
2. Huay Kaew (Chiengmai)
3. Shaw Hae (Prae)
4. Sakunothayan (Pitsanuloke)
5. Muang Kao (Sukothai)
6. Kai Bangrachan (Singburi)
7. Don Jedi (Supanburi)
8. Jompol Cave (Rajburi)
9. Huay Vang (Prachuab Kirikan)

10. Nakorn Rajsrima Arboretum (Nakorn Rajsrima)
11. Head Nobparattadha (Krabi)
12. Bokorani (Krabi)

VITA

Jira Jintanugool was born in Ranode District of Songkhla Province, Thailand. He attended the elementary and secondary school in that District and graduated from Triem Udomsuksa School in Bangkok in 1962. He then entered Kasetsart University, and in April, 1967, received the Bachelor of Science degree in Forestry.

After graduation, he joined service in the Department of Land Development and served as Forestry Officer until he was granted a scholarship from the government of Thailand to study towards a Master's degree in 1972. He married Sumalee Pochanasomburana in May, 1972.

In September, 1972, he entered The University of Tennessee and began study toward the Master's degree. In December, 1974, he completed his course of study, and in March, 1975, received the Master of Science degree in Forestry. He is a member of Xi Sigma Pi.