THE PROBLEM OF POPULATION GROWTH IN THAILAND: WITH EMPHASIS ON FOOD PRODUCTION AND FAMILY PLANNING

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY

RADOM SETTEETON

1967

This is to certify that the

thesis entitled

THE PROBLEM OF POPULATION GROWTH IN THAILAND : WITH EMPHASIS ON FOOD PRODUCTION AND FAMILY PLANNING

presented by

RADOM SETTEETON

has been accepted towards fulfillment
of the requirements for

PhD degree in SOCIOLOGY

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ABSTRACT

THE PROBLEM OF POPULATION GROWTH IN THAILAND:
WITH EMPHASIS IN FOOD PRODUCTION AND FAMILY PLANNING

By Radom Setteeton

Rapid population growth is one of the major obstacles confronting national development of a country, as it brings about many unfavorable population characteristics unfavorable to developmental programs both social and economic. The rapid increase of population may make it difficult for a country even to maintain the present standard of living, including sufficient food for interior consumption. If this happens to be the case, the hope for the development of the country is likely to be dim.

During the past several decades much effort on the part of the Thai government were put on various activities to accelerate progress of the country without realizing the importance of the demographic factors which affect the developmental programs. It was not until 1963 after the first National Seminar on the Population of Thailand was held, that attention was paid to the demographic factors in relation to the overall development plans. Many governmental officials and scholars in Thailand, however, still believe that there is no population problem in Thailand. Some even argue that Thailand is still depopulated and that increase in population will increase social and military power and will ultimately bring abundance to the country.

The purposes of this study were: to analyze the contemporary

demographic situation in Thailand under the guidance of demographic and social theories; to explain how population growth affects the socio-economic composition of the country; to explain and predict the impact of socio-economic factors upon the growth of population; and to explain socio-economic factors relating to food production and family planning.

Various theories in demography, sociology, and economics related to the problem of population growth were used as a guide for analysis of the emperical data and information derived from the following sources: Population Census of Thailand, governmental documents, papers presented to the first and second National Seminars on the Population of Thailand, United Nations, and research reports of the Family Health Research Project. Total dependency ratio and per capita income were employed as the indicators of the state of over-population.

It was found that the current population growth rate of Thailand is relatively high, i.e., 3.2 percent per annum, and the dependency ratio in 1960 was 124. Yet, Thailand cannot be judged overpopulated, as, during the period of investigation, the per capita income constantly increased. Considering her capacity for food production, Thailand will be able to feed her population for at least 15 years in future, even with the present conditions of production. Furthermore with the expansion of the agricultural land and with the application of scientific techniques it is possible for Thailand to increase her rate of agricultural production to a level higher than the present rate of production.

However, the findings do imply that there are many population problems caused by the rapid rate of population growth. If the present rate of population growth continues, in the long run socio-economic problems will become serious and there will be less hope for the

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The result of the experiment on family planning program in Photharam district shows that the expansion of such program throughout the country is probably possible. At any rate, the best solution for the population problems of Thailand is the limitation of family size and a simultaneous increase in agricultural production.

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THE PROBLEM OF POPULATION GROWTH IN THAILAND: WITH EMPHASIS ON FOOD PRODUCTION AND FAMILY PLANNING

By

Radom Setteeton

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Sociology

1967

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ACKNOWLEDGEMENTS

Behind the completion of this dissertation is aid and encouragement from various sources. It would be my wish to acknowledge all assistance, but unfortunately it is impossible.

I wish to express my deep gratitude to the Agricultural Development Council whose fellowship enabled me to study in the United States for four years.

To Dr. William H. Form I owe special thanks as the first Professor to give me a clear idea of the complexities of the social system and to provide one framework for the analysis of society.

To Dr. J. Allan Beegle, my Major Professor, for teaching me Demography and Rural Sociology; for guidance in my education; and for help in writing this dissertation as well as other help. I feel lacking of appropriate words to show my deep appreciation and my gratitude.

I am grateful to the members of my guidance committee, Dr. J. Allan Beegle (Chairman), Dr. Charles R. Hoffer, Dr. J. W. Artis, Dr. Sheldon G. Lowry, and Dr. James R. Hundley, Jr., for their guidance and advice through the years. A special thank is due Dr. Hoffer for his critique and advice when I first formulated my outline of the dissertation.

I wish to express my gratitude to Dr. Amos H. Hawley from whom I received valuable materials concerning his research on family planning in Thailand.

To my friends, Thaveep Thaveepanich and Vudhichai Chamnong, I owe special thanks for their valuable materials providing necessary data

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Last, but of special importance, I wish to express my deep appreciation to my wonderful wife, Arree, whose patient help and encouragement during my five years as a student here, has been invaluable.

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CHAPTER I

INTRODUCTION

One of the major obstacles confronting the national development task is the rapid growth of population. This is especially true for most of the underdeveloped countries whose annual rate of growth of population is high. Thailand, whose present population is approximately 34 millions and whose annual rate of growth is as high as 3.2 percent, is among the countries in this category.

Population growth is both cause and consequence of social and economic conditions. Too rapid growth of population often places members of a society under undue pressure simply to survive. India is the well known example. Improvement of food production, or food procurement in case of those countries whose economy is that of producing other commodities in exchange for food from other countries, is thus among the priorities. Following this problem are other economic problems derived from the scarcity of resources to be divided among the rapidly expanding population, for instance, the shortage of capital, the rising price of land, the lowering of wage rates and unemployment. Many social problems are also derived from rapid population growth, for instance, education, health, and housing. One can list all functions of public administration but will not find one which is not affected by the growth of population.

On the other hand one will find that many social and economic conditions affect population growth. The most obvious factor known to accelerate population growth is the improvement of medical technology

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which helps to reduce the death rate while the birth rate is still high. Religious attitudes and beliefs are other important factors. High birth rates and strong resistance to birth control, for instance, are likely to be found among the Catholics and the Buddhists. Traditional characteristics tend to support the preference for relatively large families, while urbanized characteristics tend to help reduce the size of families.

Population growth is viewed as important - though by no means the only - factor which affects social and economic conditions. In the same way it is unsound to think of any social or economic factor as the sole factor affecting population growth. Population growth and social and economic conditions are to be understood as being both cause and consequence of one another. Social class, for example, which usually includes differences in income level as one of its components, is associated with other phenomena affecting fertility and mortality, for instance, health and education. The word "starvation" connotes the situation of having nothing to eat, which is the problem of deficiency of food. But in India many persons starve to death while many sacred cows, a good source of protein, are roaming the villages and cities.

Purpose and Scope

The purpose of the dissertation is to analyze the contemporary situation of population growth in Thailand under the guidance of demographic and social theories. More specifically the purpose is to explain how population growth affects the socio-economic composition of the country; to explain and predict the impact of socio-economic factors upon the growth of population; and to explain socio-economic factors relating to food production and family planning.

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problems pertaining to population growth with special emphasis on food production and family planning. In other words an attempt will be made to answer these questions: Is population growth a real problem for Thailand? Will the country be able to feed her increasing population? Is family planning necessary for Thailand? If so, should it be carried out, and will there by any possibility for success? As for the latter, a case study in a district area in Thailand will be discussed.

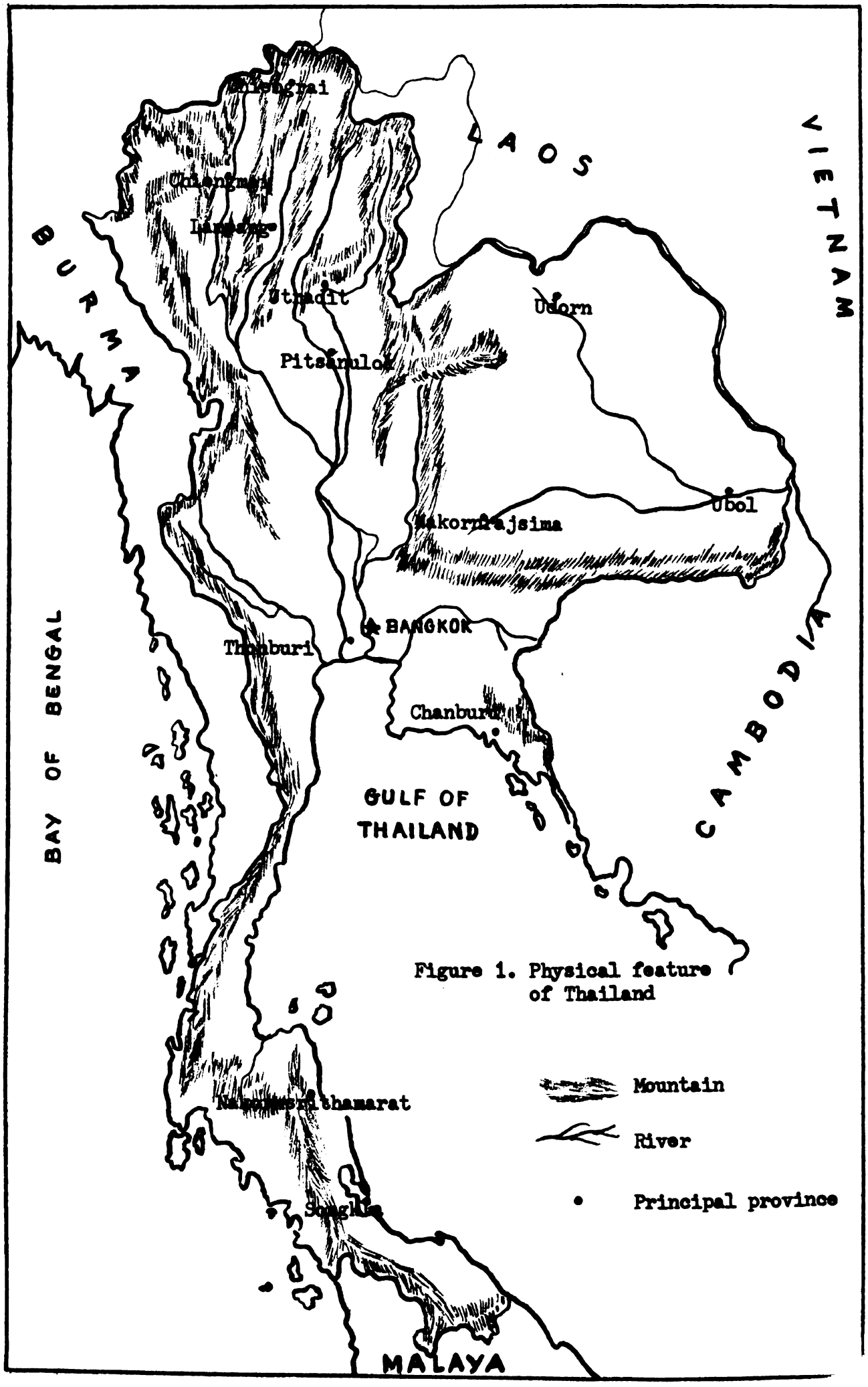
Methodology

Various theories in demography, sociology and economics which relate to the problem of population growth will be outlined. Observations will be made regarding the actual situation in the country. Empirical data obtained will be used to test the plausibility of some of the theories, and, at the same time, theories will be employed to explain and predict the future. Deductive reasoning from secondary data will be used. Statistical techniques will be applied where pertinent.

Thailand Today

For a better understanding of the discussion which will follow a brief description of the country is necessary.

Thailand is a small, independent, tropical country located in the Southeast corner of Asia with a population of 34 million. Its form of government is a unitary, parliamentary, constitutional monarchy. Its area approximates 514,000 square kilometers or 200,000 square miles divided into nine administrative regions and 71 provinces. The economic, social, and cultural life of the country focus on the capital city of Bangkok on the Chao Praya River, 25 miles inland from the point



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where the river flows into the Gulf of Thailand. The country is roughly divided into four natural regions: (1) the mountainous north, (2) the central plain drained by the Chao Praya, (3) the northeastern plateau and the eastern regions, and (4) the peninsula, shared with Burma along the west and Malaya to the south.

The language is Thai - a monosyllabic, tonal, branch of the Indo-Chinese linguistic family. Chinese and English are used in many urbanized areas. The Cambodian language is used in one of the northeast provinces and the Malay language is used in at least four provinces in the south. As for dialects, there are three of them, i.e., that of the north, that of the northeast, and that of the south. Buddhism is the national religion. The two important religious minorities are Christian and Islam. Primary education is compulsory and free between the age of eight and fourteen. Secondary education in government schools is free. There are nine universities altogether. Six are located in Bangkok. The remaining three are in the north, the northeast, and the south.

Agricultural pursuits occupy 83 percent of the population, and the economy of Thailand is distinctly a "rice economy". Among the crops of secondary agricultural importance at present are coconuts, rubber, field crops, fruits, pulses, corn, cassava, chilies, and various fibers. Water buffalo and cattle provide the draft power on the farms and road transportation in rural areas. Hogs, fowl, and pond fish are raised for food.

Fishing ranks second only to agriculture in the nation's economy, and fish, both fresh and salt-water, and other seafoods play an extremely important role in the nutritional status of the people. The government encourages both pond fish culture and shrimp farming.

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The principal exports are rice, rubber, tin, and teak. The principal imports are manufactured goods, mechanical and transport equipment, and fuel oil. Actually about 7 percent of food requirements are imported foods, but they are predominantly "luxury" items and are usually consumed in Bangkok and other major cities.

Water transportation is the most important means of inland transportation, carrying about three fourths of the country's freight traffic. An extensive railway system with approximately 2,000 miles of meter-gauge track fans out from Bangkok, extending well into the four major regions. Highways, compared to that of ten years ago, are much improved both in quantity and quality. The total length is approximately 7,920 miles. Hard-surfaced roads now radiate out from Bangkok for several hundred miles, and commercial trucking is rapidly becoming a major means of transport.

The family as a unit, averaging 6 persons per household, is the most important institution in Thai rural life. The rural family usually lives in a small house on about 10 acres of land. The average family has at least one or two buffaloes as draft animals. Family members are the main source of labor. The village is the most important social unit, next to family, in rural areas. The survival of the families seems to depend on the village which gives them a warm feeling, protection, identity, and affords socialization.

Organization of the Thesis

Chapter II presents selected demographic theories and related propositions as a basis and a guide for the analysis of the problems of population growth in Chapter IV and the later Chapters. The entire

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Chapter III is devoted to the presentation of demographic data for Thailand. No attempt is yet made to relate these data to the problem of population growth. Chapter IV contains the analysis of the consequences of population growth based on demographic theories presented in Chapter II and empirical data from Chapter III. The analysis of the socio-economic and cultural conditions as the causes of population growth is found in Chapter V. Considerable space is provided for the discussion of fertility and family planning. A case study of the pilot project of family planning undertaken in a rural district of Thailand is also presented here. The analysis is based on demographic theories presented in Chapter II and emperical data in Chapter III. Chapter VI is concerned with food production. The analysis is an attempt to answer the question of whether Thailand will be able to produce food for her future population. Finally, Chapter VII contains the conclusions and implications of the findings.

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CHAPTER II

SOME DEMOGRAPHIC THEORIES AND RELATED PROPOSITIONS

Generally, demographic theory is concerned with the dynamic aspect of quantity, quality, distribution and composition of population. Here, attention is given to the problem of population growth, its causes and consequences in relation to socio-economic conditions. All demographic theories presented in this Chapter have been selected for their utility in the explanation of the problems of population growth, food production, and family planning, the main foci of this study. Although it is my intention to use theory in a broad sense I am also aware that some ideas included can hardly be regarded as theory. This is the reason the word propositions has been included in the Chapter's title. Demographic theories and related propositions are presented in this Chapter as a basis and guide for the consideration of the problems of population growth in the later Chapters. It is hoped that this procedure will avoid congestion and confusion in those Chapters reserved for the presentation of data.

In keeping with our problem, demographic theories and related propositions have been groupped into four categories: (1) those which explain component facters and trends in population growth in general; (2) those supporting the stimulation of population growth; (3) those discouraging the stimulation of population growth; and (4) others relating to population growth. Theories and propositions in the fourth category do not fit into the other three categories but are related to our particular problem in some way or are distinctive in some respects.

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Theories and Propositions Explaining Components, and Trends in Population Growth in General

Theory of the Component of Population Change[1]

Change in size of population results from changes in the numbers of births, deaths, and migration. Let P_o be population at beginning of period, P_n be population of end of period, B be number of births, D be number of deaths, M_i be migration in, and M_o be migration out. Then $P_n = P_o + (B - D) + (M_i - M_o)$. Increase of population resulting from the number of births over number of deaths has been referred to as "natural increase".

In the analysis of world population growth, the factor of migration is inapplicable. In other words the world population growth consists of "natural increase" only. The equation just cited may be used for the analysis of population change in any physical area smaller than the world, e.g. a continent, a country, or a district. However, at present when quotas of immigrants into any country are so limited so that the annual number of immigrant is small, migration is sometimes being ignored in the analysis of population change in such country, as its effect on the total change is so small and insignificant.

The Malthusian Theory of Population[2]

According to Thomas Malthus (1798), population increases in a

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1. Dennis H. Wrong, Population and Society, New York: Random House, 1962, p. 2.

2. This theory is so well known and may be found in most demographic and economic books. As for example, here are three of them: Mentor Book, Three Essays on Population: Thomas Malthus, Julian Huxley, Frederick Osborn, New York: The New American Library, 1960, pp. 13-59; Clifford L. James, Principles of Economics, New York: Barnes & Noble, Inc., 1961, pp. 212-213; Gray Truitt, Visualized Principles and Problems of Economics, New York: Oxford Book Company, 1936, p. 68.

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geometric ratio while subsistence increases in an arithmetic ratio. Unless population growth is checked by such preventive measures ("preventive checks" which prevent new life from being born) as moral restraint, late marriage, and celibacy, or by such positive measures ("positive checks" which eliminate life already in existence) as wars, famine, and disease, population numbers will outrun a nation's ability to supply food.

The past history has shown that Malthusian theory lacks the quality of universality. The population growth trend of the United States, for example, is obviously incompatible with such a pattern. Besides, the improvement of agricultural techniques, including the use of fertilizers, the control of plant diseases, and agricultural mechanization undoubtedly lead to the expansion of food production. The defects in Malthusian theory derived from his failure to foresee that technology in food production can be improved and that the beliefs and goals of individuals and social systems can be changed. This includes changes in positive beliefs and goals about having a larger family to the beliefs in the advantage of having a smaller family, when society changes from traditional to an urbanized one.

Theory of Logistic Curve of Population Growth[3]

Actually this theory was formulated in the first-half of nineteenth century by Verhult but it is now usually associated with R. Pearl and G. U. Yule (1871) or R. Pearl and L. J. Reed (1920).

The essentials of the theory are that (1) Growth is regarded as

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3. Joseph J. Spengler and Otis Dudley Duncan, eds., Population Theory and Policy, Illinois: The Free Press, Glencoe, 1956, pp. 30-31.

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a function of the size and density of the population itself; i.e., with an increase in the size and density of a given population living in a constant environment, the birth rate will decrease and the death rate will increase, hence the rate of growth decreases; and (2) The maximum size of population is limited by cultural conditions and technology of production. Let N be the actual population size, K be the maximum size of population, then N = K/2, i.e., the increase of population might be pictured as a symmetrical bell-shaped curve which rises to the point where actual population is one-half the maximum (S - shaped curve), and then declines toward zero.

This theory is under attack in many respects. It is not universal. Population growth did not always follow this pattern and it fails, just as Malthusian theory, to take into account the possible changes in the technology in food production, changes in aspirations, and changes in reproductive behavior.

The Theory of the Demographic Transition[4]

Underlying the theory of the demographic transition is the notion of a demographic evolution correlated with stages in the process of modernization, from a Pre-industrial stage (Stage I) to Pre-Western stage (Stage II) and then to a Modern Western stage (Stage III). Stage I is represented by the stability of population size caused by the balance of high, though fluctuating, death rates with high birth rates. During Stage II population begin to experience the effects of industrialization and modernization; improvement in nutritional and health standards help bring the mortality rate down while the fertility rate remains high.

4. Wrong, op. cit., pp. 23.

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The gap between mortality and fertility is widened, resulting in the rapid growth of population. However, at the end of this stage, with the influence of more mature industrialism associated with other social and cultural changes, preference for smaller families increases and thus the fertility rate declines. At Stage III a low mortality rate is balanced with low, though fluctuating, fertility rate. At present, only the fully modernized societies of western Europe, North America, and Australia have reached this final stage. The remaining regions of the world, except Africa which is still largely in the first stage, are in the different degrees of the transitional stage. The three stages are sometimes labeled, with respect to the change in population size only, as High Growth Potential, Transitional Growth, and Incipient Decline.

Corresponding to the three stages of population growth are three different types of age-sex structure. The pyramid having a widened base is the age-sex structure characteristic of the Pre-Industrial stage. This is the structure of a "young population", i.e., one that contains a large proportion of young persons and a low average age. The "triangular type" having its two sides rather curved with a little bit wider top than the first type, is the age-sex structure characteristic of the Pre-Western stage. The proportion of children is relatively smaller and the proportion of adults is higher than that of the Pre-Industrial stage. The "bulb type" is that of the Modern Western stage, showing an "old population", i.e., a population with a large proportion of old people and a high average age.[5]

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5. For the concept of "young" and "old" population see Ansley J. Coale, "How a Population Ages or Grows Younger", in Ronald Freedman, ed., Population: The Vital Revolution, New York: Doubleday & Co., Inc., 1964, pp. 47-58.

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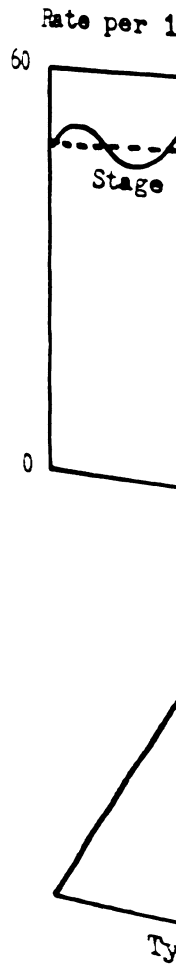
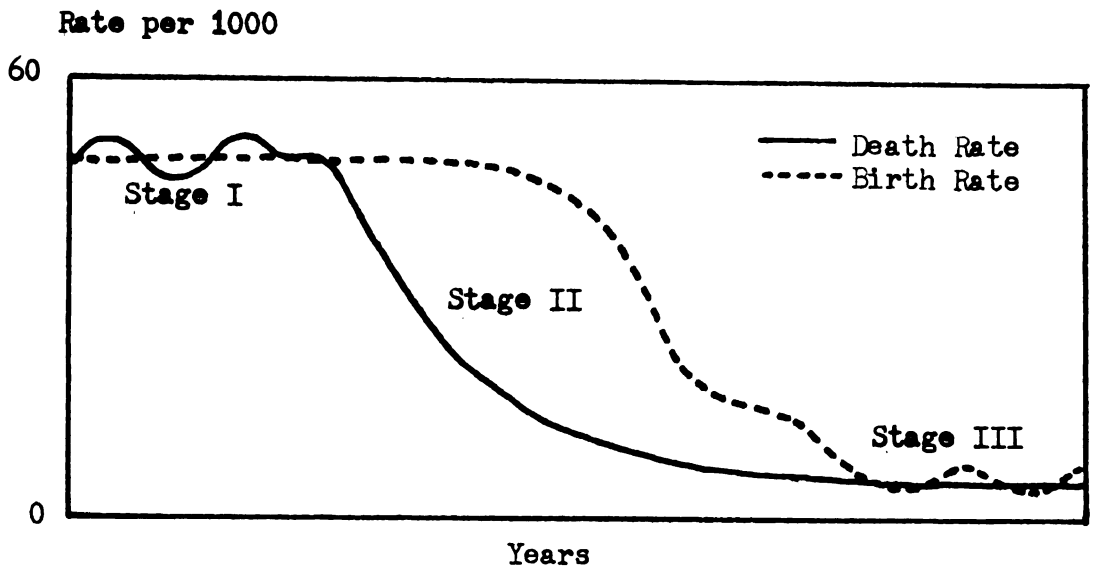
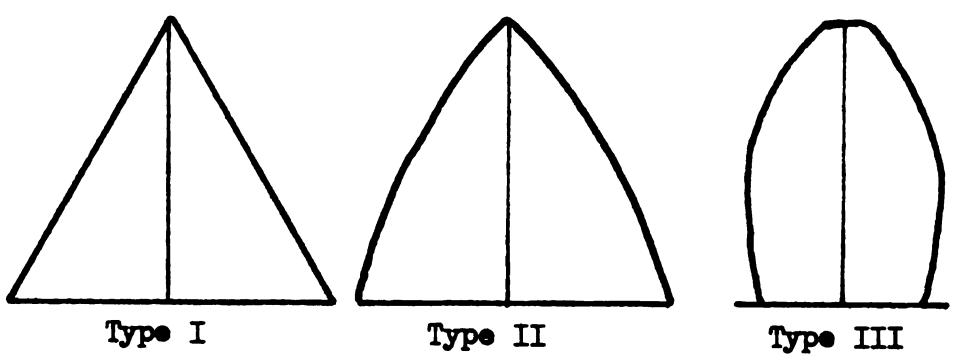


Figure 2. Three-stage model of demographic transition with three types of correspondent age-sex structures





Transition theory has been developed after the pattern of population growth in Europe with the common assumption that contemporary underdeveloped areas will follow this pattern in their process toward modernization. But accumulated evidence from a variety of sources reveals many falacies in the assumption.

First, the past trends of population growth in many countries do not conform to the transitional model, while those which conform to the model show variations in the timing and duration of successive stages of evolution that cannot be predicted from the generalized model.

Second, demographic and socio-economic situations at the starting point of the theory, i.e., Stage I, of European countries and that of Asian and African countries were much different.

a) Density. Population density of eighteenth and nineteenth Europe were much lower than that of the nonwestern countries (particularly in some countries as India, China, and Indonesia).

b) Fertility. Fertility in premodern Europe was markedly lower than in Asian and African countries today.

c) System of land tenure. The system of land tenure in Europe was relatively pluralistic.

Third, according to the theory, the "demographic gap" in Stage II was caused by declining mortality combined with stable fertility. It has been argued by many writers that one of the significant factors contributing to European population growth was more frequent marriage and the decline in the age at marriage.[6]

Fourth, in regard to the temporal aspect of the decline in mortality

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6. Wrong, op. cit., p. 21.

rates occurring in Stage II, there is a sharp distinction between Western and non-Western countries. In Western countries the mortality rate was gradually decreasing, while in non-Western countries, because of the diffusion of culture pertaining to public health practices and medical technology, and with aid from the Western countries, the mortality rate dropped sharply within a very short period of time.

Despite all of the above criticisms the transition theory is firmly imbedded in demographic thinking. One may recall the usefulness of the "ideal model" for scientific studies in various fields. One does not expect to see the real phenomena duplicated exactly in all details in the ideal model, but to use the ideal model as a guide for studying the variations. This also holds true in the case of transition theory. All criticisms only show the variations of real phenomena from the model. The obvious truth in the theory, despite the variations from real phenomena, is the change from balancing high mortality rate with high fertility to balancing low mortality with low fertility. As a genuine theoretical model it can be used to predict the future growth patterns of the underdeveloped countries, particularly those administering family planning policies and program such as India, Taiwan, Japan, and Puerto Rico.

The Theory of Cyclical Growth of Population[7]

Both Ibn Khaldun and E. F. Wagemann maintained that population growth is cyclical, and their reasoning is quite similar in many respects. However, the former seems to place emphasis on planned change rather than change which happened to be derived from changing economic or socio-cultural conditions.

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7. Spengler and Duncan, op. cit., pp. 8 & 18.

Khaldun related population change to economic, political, and social-psychological conditions. He held that, besides the actual situation, expectation of men about productivity in future played an important role in the changing size of population. Favorable expectations made for fertility and growth while unfavorable expectations made for decline. In regard to the actual situation, good socio-economic conditions and political order stimulated population growth by increasing fertility and checking mortality. Population growth and density, in turn, caused a division of labor and rising income. Rising income stimulated luxury, rising taxes and other changes which in several generations produced political decay, economic decline, and depopulation.

Wagemann held that improvements in technology of production would help the society to overcome the law of diminishing returns, and thus enable the population to grow larger. But at a certain point, the socio-economic conditions, e.g., social organization, capital formation, and production organization, will adjust in such a way that depopulation will be the result. The conditions of underpopulation would be again replaced by one of over-population to which further adjustments must be made. Thus, according to Wagemann, population growth will be cyclical resulting from sequences of alternating under-and-over population.

Theories and Propositions Supporting the Stimulation of Population Growth

Following Reuter,[8] the theories and related propositions supporting the stimulation of population growth will be classified into four groups

8. Edward B. Reuter, Population Problems, New York: J. B. Lippincott Company, 1937, pp. 138-139.

according to the motivation which underlied them: Social, Political, Economic, and Religious and Moral.

The Social Group

The Theory of Sociality.[9] Tracing from history the stages of social evolution, Adolphe Coste stated that the most important factor causing progress is the growth and density of population. He maintained that an increase in size and density leads to an increase of interaction, quantitatively and qualitatively, among the members of the society. Exchanging, accumulating, and transmitting of experience from generation to generation resulted in the progress of the society. He pointed out that the first great organized societies - Egypt, India, and China - appeared where the concentration of the population was great. The military power of such societies as Babylon and Egypt, were made possible by the large size and the density of population. On the other hand, decreases in size and density of population resulted in the decline of society. The decay of Roman Empire is a good example. His theory was put into the formula - Sociality = $\frac{\text{Social Power}}{\text{Population}}$; where social power = population size x density. Density is measured by the concentration of the population or the proportion of the big and small cities, to the whole population of the society.

Many defects may be found in Coste's theory. The obvious falacy is his one-sidedness in taking population growth and density as the single factor contributing to the progress of civilization. If his theory holds true then China and India whose estimated population density in 1958 were 69 and 121 per square kilometer, respectively, should be much

9. Pitirim A. Sorokin, Contemporary Sociological Theories, New York: Harper & Row, Publishers, Inc., 1956, pp. 359-370.

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more "civilized" and powerful than the U.S. or the U.S.S.R. whose populations in the same period were 19 and 9 per square kilometer, respectively.

The Political Group

The political group saw the advantage of large and growing population in military terms, both from a defensive and offensive point of view. Included in the defensive point of view is also the feeling of security from being exterminated by natural causes.

The Theory of Group Security and Survival.[10] The primitive groups whose number was usually small felt insecure and feared being destroyed by the enemies or by the nature. This, together with the realization of hardship and high rates of death, stimulated a desire to have a large and increasing population, for strength, security, and to prevent the extermination of their group. A good example is the early Jews whose desire was expressed in the divine injunction - "be fruitful and multiply and replenish the earth", and the divine promise that their offspring would be "as numerous as the sands of the seashore." The desire for the increase of population was also expressed by many of the ancient as well as medival and early modern writers who worried about the high rates of mortality which were found throughout the world at that time, together with other phenomena, such as, epidemics, famines, and wars, which resulted in sudden reduction of population.

The Theory of Military Strength. Those whose thought concerned the military power of the state saw the advantage of having large populations for defensive purposes, i.e., sufficient number of men to be drafted when attacked by the enemy, and for offensive purpose, i.e.,

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10. See Reuter, op. cit., p. 9.

sufficient soldiers for their aggressive purpose, and for occupying conquered territories. This was the case of ancient Rome, China, and the rival princes in European history.

It seems that the reasoning of those belonging to the political group may have been right in particular times and situations. But we see that it does not hold true for all places and times. Population policies and practices of societies were relatively rational, i.e., they may operate either to retard or to stimulate increase according to particular situation. Sometimes the reduction of population may mean the maintenance or an increase of group security and survival. Nearly all of the preliterate people practice infanticide, to eliminate the unnecessary and unwanted babies. Among the Greeks the Romans, and the Indians infanticide was also common and sometimes, in case of the former two, it was done for eugenic purpose. The practice of killing the useless members of the group, the old and the sick, was also a common practice among many tribal groups, e.g., the Tasmanians, the Figians, and the African tribes. The Eskimos whose food supply was scarce had to practice both infanticide and killing of the old and the sick in order to allow the others to live.[11] In modern societies such as Japan, Finland, and German Democratic Republic, abortion is legal.

In regard to military strength the theory does not hold true under present conditions. Quality of arms and quality of population, both soldiers and civilians, are more important than the sheer number of population alone. The three Arab countries (Egypt, Jordan, and Syria) were defeated by Israel within three days in the battle of June, 1967, despite the fact that their total combined population, was approximately

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11. Ibid., pp. 134-135.

fourteen times of that of Israel.[12]

The Economic Group

The Theory of Population Growth as Source of Abundance.[13] Many thinkers have believed that population growth was a source of abundance. Two major reasons being given to support the argument were: division of labor which caused other progress, and the non-applicability of the law of diminishing returns in agricultural production due to many factors.

A. H. Everett maintained that within a given area an increase of population causes a division of labor which resulted in the increasing of skill and productivity of labor. Thus, wages will rise, manufacturing and trade will be expanded. H. C. Carey holding the same opinion as that of Everett added that increasing per capita output was not checked by diminishing returns in agriculture since cultivation proceeded from inferior to superior soils. Leroy-Beaulieu and Wagemann argued that the law of diminishing returns was more than counterbalanced by technical progress, capital accumulation and, added by the former, international division of labor.

The Mercantilist Doctrine of Population.[14] Although the mercantilists, in the 17th and 18th centuries, emphasized the economic, political and military advantages of a large and growing population, the doctrine itself is, nevertheless, an economic doctrine. The Mercantilists

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12. The total population of Egypt, Jordan, and Syria is approximately 34.2 millions; while that of Israel is approximately 2.4 millions.

13. See Spengler and Duncan, op. cit., pp. 17-18.

14. See Eric Roll, A History of Economic Thought, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956, pp. 54-63; Reuter, op. cit., pp. 151-154; Spengler and Duncan, op. cit., pp. 8-10.

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paid special attention to gaining a "favorable balance" in international trade which they thought would result in an influx of gold and silver which would strengthen the nation. Much human labor was required for the manufacturing of goods for international trade. Increase in population meant increase in cheaper labor, one way to reduce cost of production. National wealth, not the welfare of the labor, was their concern. Cantilon suggested that the problem of food shortage for the increased population can be met with the exchange of food from abroad for manufactured goods produced at home. To mitigate the hazards of trade, colonization became an important weapon for them, The mercantilists demanded a state strong enough to protect the trading interest and to break down any barriers of the expansion of their trade. Given such a position, it is no surprise that the mercantilists favored the stimulation of population growth.

In the 20th century the politico-economic philosophy of the mercantilist is obsolete. Their notion of "balance of trade" has no practical significance in that the mercantilists take into account in their theory only the purchase and sale of so called "visible" goods while the purchase or sale of the so called "invisible" items, such as tourist and shipping services, together with capital transaction (international lending and borrowing, and interest and dividened payment) are excluded. The present economic thought takes into account both national wealth and individual labor. Exploitation of cheap labor is considered immoral and is being seen as a wrong approach in modern administration. Using colonization as a means of trade expansion is practically ended. In the light of Keynesian proposition that investment and the propensity to consume together determine income and employment one sees the difficulty

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to provide work to all the excess population unless there is sufficient investment.[15]

The Religious and Moral Group[16]

The doctrine of the great religions of the world directly or indirectly support ideas that will result in population growth. That of the Jews has already been referred to under the sub-heading of "The Theory of Group Security and Survival". The teaching of Muhammad, the leader of Muslims is that marriage is not for sexual pleasure but for the generation of new life. Man has been taught to marry woman who is "richly fruitful". Hinduism and Buddhism have a common belief in Karma, i.e., man is chained to a round of birth and rebirth. In addition Buddhism embraces a rather strick morality which seems to lead the married couple, just as in Islam, to accept the idea of marriage for regeneration rather than for sexual pleasure. The Catholic church has always taken a strong expansionist stand; and the Catholic family is relatively large. If anti-birth control measures are regarded as an indirect factor contributing to population growth, then in the societies there are many persons who should be regarded as the supporters of population growth because they reject birth control purely on the ground of morality. Birth control, they think, leads to promiscuity.

Theories and Propositions Rejecting
the Stimulation of Population Growth

The name of Malthus is widely known as one of the distinguished

15. See Roll, op. cit., pp. 484-504; James, op. cit., pp. 305-308.

16. See Three Essays on Population, op. cit., pp. 106-107; Reuter, op. cit., p. 10; Christian Humphreys, Buddhism, London: Wyman & Sons Ltd., 1958, pp. 103-107.

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theorists who believes that an increase of population, at a certain point, tends to produce over-population which is a major cause of many socio-economic problems. But as his theory has already been discussed earlier in this Chapter, only some aspects will be mentioned in this section. Here, again, theories and propositions will be divided into four groups as has been done in the previous section.

It has to be noted that most of the theorists who reject the stimulation of population growth fall under the "economic group". Though there are many who discussed social condition in relation to population growth, very few explicitly used social conditions as the point for the objection of the stimulation of population growth. This is also true as far as religion and morals are concerned. The fact might be that economic problems, for instance food production, is so important for the survival of individuals and groups that it received first priority in consideration. In religious and moral considerations, there might be a feeling that there is little connection between them and population growth or it is not important enough to receive much attention from the theorists.

The Social Group

Fredirick Osborn[17] maintained, the common belief, that there is no pressure of population growth among primitive societies because there are no monetary cost requirements for education and because labor contributed by children to the family offsets the cost of food provided for them by the family. At the present, this of course, is not always true. Recent studies indicate that the problem of having many children is found among the primitives as well as the poor in various parts of the world. In

17. See Three Essays on Population, op. cit., pp. 92-93.

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18. Sorokin, S

19. Ibid., pp

the more advanced societies children remain dependent on their parents for education through a longer period, perhaps until they are twenty or more. Large numbers of children is therefore a major handicap to the progress of most families as the expenditure for taking care of the children and for their education is high. This idea is also true when we move our analysis from families as smaller sub-systems to a larger social systems; rapid population growth tends to impede national educational programs and the acquisition of new skills.

The Political Group

Thinkers within this group related population growth, as a cause, to many undesirable political phenomena. Many, such as D. Frymann, W. G. Sumner and A. G. Keller saw population growth as the cause of war. Reasons given are many: some simply explain the correlation through the insufficient space caused by an increase of population which makes it necessary to make war to gain more territory; some state that insufficient food and good land on which to produce food for a growing population leads to war; some explain it in terms of psychology, that a rapid increase in population was followed by an increase in the imperialistic attitudes of nations.[18]

F. Carli theorized that a sudden change in population, either by the abrupt decrease or increase in population, will cause revolutions and inner crisis, due to the widenning of social discrepancy among the various classes of the same society. The difficulty for the talented members of the lower classes to move up into the upper ones leads to revolution and crisis.[19]

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18. Sorokin, op. cit., pp. 382-383.

19. Ibid., pp. 386-387.

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In the society where rate of food production lags behind rate of population growth, poverty and hunger would be the result. And, as stated by Osborn,[20] it would be very difficult for the government of any society to maintain its stability when an increase in poverty and hunger prevailed.

The statement of Osborn is rational and can be accepted without criticism. But neither that which took population growth as the real cause of war nor that which ascribed revolution and inner crisis to population growth can be totally accepted. From the past history not every increase in population led to war and decrease in population did not necessarily decrease war. This is also true in case of revolution and inner crisis. So, the best we can say is that population growth is probably one of the major causes which leads to war and that the relation between change of population and revolution and inner crisis, if any, is unclear.

The Economic Group

Belonging to this group are those theorists whose belief is that population growth leads to undesirable economic conditions. Malthus maintained that population increased more rapidly than means of subsistence (principally food). Thus, improvement of the standard of living would be very difficult since any increase in the means of subsistence would be absorved by an increase in the population. Malthus suggested that fertile land was limited and the law of diminishing return affected agricultural production. The lag of increase in the production of subsistence behind the rapid increase of population was the cause of poverty, starvation and misery.

20. Three Essays on Population, op. cit., p. 92.

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Other theorists in this group, while agreeing with what Malthus said, made additional assertions about the danger of over-population. J. S. Mill held that decreasing return could not be indefinitely offset by increasing return in non-agricultural industries since manufacturing was dependent upon agriculture for raw materials. Ultimately non-agricultural industries would be affected by the law of diminishing return as well. Von Thünen, Longfield, Senior and Say held that increase in population led to low wages (because of their low marginal productivity); Ortes stated that it led to the problem of unemployment.[21]

The Religious and Moral Group

It is rather paradoxical to state that beliefs and practices of religious and moral groups enhance and retard population growth at the same time. It is a matter of how we look at it. Catholicism and Buddhism, on the one hand, enhance population growth in that both stress marriage for generation of new life rather than for sex pleasure and both maintain an absolute opposition to abortion. On the other hand, the priests of both religions reject sex intercouse and marriage: the Catholic priests on the basis that marriage is a concession to human weakness and celibacy is a pure and desirable state; the Buddhist priests on the ground that sex is one of human desires which, according to Buddha's thought, must be eliminated and that marriage leads to many additional unavoidable mundane activities which are regarded as sin and which will put priest into the wheel of Karma (which is to be avoided.) The primitive Christian sects regarded marriage and procreation as impure and evil, a kind of animalism to be avoided. The

21. Spengler and Duncan, op. cit., pp. 13-15.

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23. Sorokin, op.
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Other Theories Concerning Population Growth

The important theories regarding the general trend of population growth and the pros and cons of population growth have already been discussed. Still there are some theories and thought concerned which are worthwhile to mention as they help in the comprehension of the problem in question.

The Theory of Parabola of the Social Evolution of the Society[23]

Corrado Gini maintained that the principal cause of the evolution of a society is the demographic factors (size, density, heterogenuity, quality) and the quality of the "germinal cells" of its population. A society usually starts with relatively small sized homogeneous population, having a high rate of fertility and simple social structure. When the size of population increases its social organization becomes more complex. Population pressure forces the society to expand its territory through war and colonization. This is the glorious period in the life of a people. Due to the loss of the bravest and most productive men in war, reproductive power of the society declines and the size of population also declines. The exhaustion of fertility first appears in the upper classes but afterwards it spreads to other classes also. Vacancies in the upper classes are filled by the lower ones who at last become weak in reproductivity too. The society becomes more democratic, industrialized, commercialized, and urbanized - the

22. About primitive Christian sects see Reuter, op. cit., p. 148.

23. Sorokin, op. cit., pp. 422-430. See also Reuter, op. cit., pp. 173-174; Spengler and Duncan, op. cit., p. 29.

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period of economic and social prosperity. But as more and more people move to the city, fertility and size of the rural people decline. The decrease in rural population and its economic impoverishment means the decrease in "demand" for economic goods produced in the cities - 'over-production' is the case. With this situation government revenue decreases and tax raising is unavoidable (to cover its expenses both internal and in its colonies). Frustrated from the aggravation of their economic situation the city laboring classes and others who suffer from the same situation burst into social crisis, disorder and riots. To control and improve the situation governmental interference in economic activities expands enormously, but in vain. The society reaches its last stage, - decay.

Sorokin attacked Gini's theory on many grounds. First, he argued that it is not universal. China and India have existed several thousands of years, and yet they are still alive with some signs of progress. It cannot be assumed that all societies, in their first stage, will have high fertility and increase in population; nor that all societies will solve their problem of population growth through emigration or colonization. Various points in the whole theory may or may not be valid.

Marx's Theory of Surplus Population[24]

Marx held that there is no universal law of population. For him biological proclivities (high rate of fertility) is not the real cause of the problem of over-population. Rather, it is the capitalist mode of production which is at fault. In the capitalist system of production, he argued, capital is the source of demand for labor. Now, as the rate of capital increase is lower than that of population increase,

24. Spengler and Duncan, op. cit., pp. 22-24.

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it is natural that there are workers who could not be employed, and these unemployed laborers are regarded by the capitalist as excess population. And, he went further, such state of "surplus-population" will always exist in the society of the capitalist (deliberately ignored by the capitalists) - waiting for exploiting.

Marx classified the "relative surplus population" (the unemployed) into three groups: (1) the "floating" category - those displaced by machinery; (2) the "latent" category - those rural population who was on the verge of migrating to the city; and (3) the "stagnant" category - those workers with highly irregular employment. Marx mentioned that the capitalists employed various means to generate unemployment - accumulation of large volume of the capital that can displace labor, expropriation of land, and the movement of dispossessed peasants out of agriculture. Marx maintained that such kinds of over-population in capitalist society would disappear when capitalism was replaced by a collective mode of production.

Concerning the demographic problem, Marx regarded unemployment as the main point to attack capitalism. He did not mention standard of living or the well-being of the workers. Under communism where work is compulsory it is no surprise that unemployment does not exist. But how about the payment in such society, and how about the standard of living? Are they better than that in the capitalist society, Marx did not mention. It is also a false assumption that "surplus-population" is deliberately created and maintained by the capitalists in order that they will be able to exploit the poor laborers. Such a situation was real in Europe at his time, but there is no such situation at present. Workers are under the protection of labor unions, and

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modern labor administration emphasizes the welfare of the workers rather than trying to exploit them.

Ohlin's Theory of International Trade[25]

Ohlin holds that international trade is different from interregional trade only in its special characteristics resulting from the existence of political borders, tariffs, different monetary systems, etc. With respect to regional specialization of production there is no difference between them.

Ohlin maintains that mutual benefit of all countries will be achieved if each country concentrates on the production of those commodities requiring resources which are abundant in its territory. Thus China, India, Indonesia, etc., would concentrate on production requiring much labor and little capital, since in these countries capital is scarce while labor is abundant. Brazil can produce coffee cheaply because the abundance of unskilled labor and the suitable soil and climate. The United States can produce automobiles cheaply because of the abundance of capital and skilled labor. High quality of products at a cheap price, resulting from such economic system, according to Ohlin, will be available all over the world through international trade, and real income for all will be maximized.

Regional specialization is not a new idea. England, for instance, has long concentrated on production of industrial goods in exchange for food produced in other countries. It seems that by such arrangement of production the problem of unemployment in the country of large population with few other resources will be relieved. But it is doubtful

25. James, op. cit., pp. 310-311.

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The Theory of Optimum Size of Population

Demographic theories and thought regarding optimum population have been rather opposite. One group, represented by Malthus and the Malthusians, disfavors population growth on the ground that it results in undesirable socio-economic conditions. The other group maintains the opposite view. The latter see population growth as source of abundance which leads to the well-being of society. The former are those who support the idea of having a paucity of population growth and the preference for small size of population; the latter support the idea of population growth to a larger size. The existence of these two opposing positions casts doubt on the accuracy of both. In fact historical and empirical data do not always support either of them. Should the question be raised whether depopulation will tend to raise or lower economic well-being, the answer would be that sometimes it may and sometimes it may not.

F. Curshman's study of famines in the Middle Ages showed that often a great decrease of the population in famished areas was followed by an improvement of the well-being of the surviving population. But, according to Rostovtzeff, depopulation which took place in the later period of Roman history (after the third century A.D.) yielded the opposite result, i.e., the general productivity of the Empire constantly decreased and problems occured in its distribution system. Further, a lower rate of population increase in one country does not always gaurantee its economic progress over the countries having a higher rate of

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population increase. In 1815 the population of France was approximately 29 millions and its national wealth was $80 billions; the population of Germany in the same year was 24 millions and its national wealth was about $35-40 billions. In the year 1914 the population of France rose to 39 millions (less than double) and its national wealth rose to $295 billion (approximately 4-fold increased); in the same year the population of Germany rose to 68 millions (triple) and its national wealth rose to $400 billions (ten fold or more).[26]

It is seen, from the above discussion, that size and density of population alone does not determine the well-being of a nation. Absolute numbers are of little importance unless related to other resources and the contemporary technology of the people. Thus a third group of theorists appear who supports neither a "paucity" (or smaller size of population) nor an "excess" but a population that will give the maximum of human welfare in a given environment and state of development of technology - "the optimum number of population." A body of thought about the optimum size of population has been present for thousands of years. Plato and Aristotle discussed the question of optimum size of population of the city-state.[27] Confucius and many Chinese philosophers had postulated an ideal proportion between land and population in an agricultural area. Many of those who supported population increase, the Cameralists, for instance, also saw that there should be some limitation of population increase.[28] However, the idea of those ancient

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26. Sorokin, op. cit., pp. 398-401.

27. For further details see Spengler and Duncan, op. cit., pp. 6-7.

28. Reutrt, op. cit., p. 151.

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The modern notion of optimum population was advanced by E. Cannan and other writers. According to Cannan, the stage of optimum will be achieved when the right movement of population has been taken, the right movement will result in the increase of output per capita and will give the maximum return to all industries taken together.[29] In other words it is the notion of how to adjust the ratio between the number of people and the space and all the available resources in order to obtain maximum production and the best welfare for all members of the society. The theory of optimum size of population is rational. According to the theory, any deviation from the optimum point, either above or below it, will result in negative economic well-being.

In fact most of the underdeveloped countries are facing the problem of over-population rather than with depopulation. So it would be more logical and more useful, here, to discuss the first aspect, i.e., problem of over-population. Concerning this point, two empirical questions should be raised. First, how do we know that a state of over-population exists? Second, what is the exact optimum number of population for a nation? The broad answer for the first question is that we know that the state of over-population may exist when undesirable socio-economic conditions are present in the society. But this is not a good answer. First, it seems to overestimate population numbers as the cause of such undesirable socio-economic conditions. It might be that other factors, for instance undeveloped technology, is the major cause. Consider a country with rich natural resources, for instance, Indonesia, but with poor people. If we can prove that improvement of technology will bring

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29. Spengler and Duncan, op. cit., p. 25.

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about abundance to this country (or any other country with similar conditions), then it has to be accepted that poor technology, not over-population, is the problem. Second, the answer does not specify exactly what are the undesirable socio-economic conditions. Actually undesirable socio-economic conditions, which may be regarded as the indices of "over-population", have already been stated in the discussion of theories rejecting the stimulation of population growth; they will not be restated here again. However, in economic term it is usually measured by per capita income; i.e., decreases in per capita income is one of the undesirable economic conditions.

Although he did not deny the importance of income as an index of the magnitude of the demographic problem, Kamerschen[30] (1964) mentioned many defects of it: (1) income as an index lacks a dynamic aspect; (2) sometimes it is inadequate and thus undependable (when compared to demographic data which are better); (3) its reliability is questionable; (4) its validity is also questionable, for instance, the definition may vary, there may be error in exchange-rate conversion, the error in measurement of hours worked, etc.; and (5) money income level in underdeveloped countries invaribly overestimates the population problem by failing to include the large proportion of nonmarket activities which prevails in such countries. Kamerschen thus proposed the use of "total-dependency ratio" as the index for measuring the state of over-population (or non-optimum population). According to Donald J. Bogue (1959)[31]

$$\text{total-dependency ratio} = \frac{\text{number of people under 20 and over 65 years old}}{\text{number of people 20-64 (economically productive)}} \times 100.$$

Kamerschen's hypothesis was that when this ratio exceeds 100

30. David R. Kamerschen, "On An Operational Index of Over-Population," Department of Economic, Michigan State University, (Mimeographed).

31. Donald J. Bogue, The Population of the United States, Illinois: The Free Press of Glencoe, 1959, pp. 101-102.

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a country is "over populated". Kamerschen pointed out many advantages of the use of total-dependency ratio as the index over the use of income as the index: (1) it has both static and dynamic aspects; (2) demographic data are abundant and dependable; (3) demographic data are more reliable and more valid than data on income; and (4) it can easily be remembered and its application is easy.

Underlying Kamerschen's assumption of the appropriateness of using total-dependency ratio as an index for measuring the state of non-optimum population are three major logical reasons. First, it is obviously seen that when the number of economically unproductive population increases relative to the productive group, i.e., the dependency ratio increases, a country has a population problem, Second, since the aged and the youth are relatively immobile, they lead to a more inefficient allocation of resources within a country as they do not move correspondingly to the demand of market. Third, this index is a kind of admixture of both the notion of an economic optimum population at a given moment of time and an optimum population growth rate over time (both static and dynamic aspects). There is one point to be mentioned here. In general, in the more advanced countries the proportion of the aged (65 and over) in the dependent group is high, while in underdeveloped countries the proportion of the youth (0-14) is high. Thus, sometimes a high dependency ratio, if appearing in a developed country, may lead to the overestimation of the population problem. The fact is that a larger percentage of the aged in the advanced countries are not necessarily dependent. Geriatrics make the man of 65 no longer economically useless. Income received from social security by the aged are injected into the income-expenditure

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It should be noted, as Kamerschen himself mentioned, that the index is not a perfect one (though it is better than income or other indices). It serves as a rough indication (but it is probably the best we have) to tell us whether the problem of over-population exists in a society. However it does not mean that a society with a higher total dependency ratio will always have a more serious population problem than the one which has a lower dependency ratio. In general, the income and dependency approaches appeared to be fairly closely correlated. For more accuracy in the analysis of population problems, it is better that both dependency ratio and per capita income be used as indices.[32] Should any incompatibility between these two indices occur, income growth rate and population growth rate have to be brough into consideration for the best judgment.

As to the second question, what is the exact optimum number of population for a nation, a direct answer cannot be given. It can only be stated that it is the number of population which, when combined with available resources in a society together with technology, will yield the highest per capita production and will produce maximum human welfare. An optimum size for any given population changes through time because of the change in quantity and quality of the other factors necessary to combine with size of population to produce the maximum welfare of the

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32. In using income level as the index usually a minimum per capita income for a specific year has been arbritrarily set up by economists. For instance, that of the year 1939 is $100; any country, in the year 1939, having per capita income below $100 is considered over-populated.

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society. It may be right to state, as James did,[33] that probably no close approximation to an optimum population is attainable. A stationary population at the optimum is the ideal goal.

Population Structure and Social Structure

Population structure and its growth trend have a close relationship with social structure as they are both cause and effect of each other. Explanation and prediction of population growth and other problems concerned would be inadequate without bringing social structure into consideration. In this respect it seems convenient to break down the total social system into two major sub-systems - rural and urban.[34] The differences between rural and urban sub-systems, their structure and their elements, provide a good clue toward the understanding of population growth and its problem as a whole. One sees clearly that, in the ordinary case, nations with higher proportion of urban population have less population pressure but better over-all welfare than nations with high proportions of rural population.

Rural societies show a considerable degree of differences from the urban societies in many respects, whether in social structure itself or in elements of the social system. The characteristics of social

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33. James, op. cit., p. 212.

34. There is not yet a perfect concept of either rural or urban. Many Sociologists propose the "rural-urban continum" which suggests the different degree of urban or rural within a particular community. Still the argument is not ended. Most of the critics argue that the concept cannot be applied to the United States and some modern countries in Europe. The reflection of this controversy can be seen in the frequency of articles on this subject which appeared in Rural Sociology from 1964 up to present. However, it is felt that the concept can still be applied to communities in most part of the world. As an "ideal" type the concept can serve our purpose well in describing the relationship between size and density of population with social structure.

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relationships in rural societies are usually described in terms of "gemeinschaft", "traditional", "folk", and "sacred"; while that in urban societies are usually described in terms of "gesellschaft", "modern", and "secular". However the polar terms gemeinschaft - gesellschaft (developed by Ferdinand Toenies in 1887) provide a broader and clearer basis for comparison of rural and urban than others and thus are widely accepted.[35]

In rural society the population is less dense, more homogeneous, and generally with less discrepancy between the classes. Size of families is usually large and mostly of the extended type. Most families prefer having more children as cost of raising children in rural environments is not as high as in urban areas and children are often viewed as added labor. Formal organizations are few both in number and in size and relationships are of the gemeinschaft-like type. Migration of young persons to urban places is usually a characteristic phenomenon as there are greater opportunities for advancement in urban places than in rural communities. The over-all characteristics of rural areas stimulates population growth. As the underdeveloped countries have higher percentages of rural population than the more advanced countries, their population growth rate is generally higher.

The over-all characteristics of urban areas have been given by Louis Wirth in his famous essay "Urbanism As a Way of Life".[36] According

35. Roland L. Warren, The Community in America, Chicago: Rand McNally & Company, 1963, pp. 55-56. See also Charles P. Loomis and J. Allan Beegle, Rural Sociology The Strategy of Change, Englewood Cliffs, N.J., Prentice-Hall Inc., 1960, pp. 12-14.

36. Louis Wirth, "Urbanism As a Way of Life", in The American Journal of Sociology, Vol. XLIV, July, 1938, pp. 1-24.

to Wirth urban areas are places where population is large, dense, and heterogeneous. His explanation of social relationships in urban areas conforms to the term "Gesellschaft". There are more social classes and greater discrepancy between classes in urban areas. Size of families is usually small and mostly of the nuclear type. Most families prefer having less children as cost of raising children in an urban area is relatively high, besides, children are not considered as labor. Formal organizations are numerous and often of large size. Although urban places receive in-migrants from rural areas, they themselves are not the places which produce increases in the population of a nation. Thus, in more advanced countries (toward modern Western type) where relatively larger population live in urban areas, the population growth rate is relatively low.

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CHAPTER III

POPULATION OF THAILAND: PAST, PRESENT, AND FUTURE

Sources of Demographic Data[1]

The four sources of demographic data in Thailand are:

1. census
2. registration
3. immigration record
4. incidental sources

Census

It was not until 1911 that a census was taken in Thailand. Previously several "population counts" were taken mainly for administrative and military purposes. Actually in 1903 an attempt had been made to take a census, but the work was incomplete as seven Montons or regions (out of nineteen) were excluded. The total population counted was 3.8 millions.

A nationwide census, from the beginning until the present, has been taken six times altogether, i.e., in 1911, 1919, 1929, 1937, 1947, and 1960. Before 1952 the work was carried out by the Ministry of Interior and the Ministry of Municipalities. Later the work was transferred to the Central Statistical Office, National Economic Development Board.

Included in the population count in 1903 were these items:

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1. Wivit Siripak, "Sources and Evaluation of Demographic Statistics in Thailand", in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, pp. 89-98.

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household, nationality, language, sex, priesthood, livestock and vehicles possessed. In the 1911 census three items were added, i.e., age, literacy, and occupation. In 1919 and 1929 censuses another two items were added, i.e., religion and smallpox vaccination. Included in the 1960 census were household (farm, non-farm), nationality, age, sex, place of birth, marital status, priesthood, residence, previous residence (for those whose period of living in present residence was five years or less), number of population who live in the municipal areas, ability to speak Thai, literacy, school completion level, number of live-births, and occupation. It has to be noted that those whose residences were uncertain, i.e., the hill tribes (in the North and Northeast), the sea tribe (in the South) and the forest tribes (for example, the Pi Tong Luang in the North, and the Semang in the South),[2] were excluded.

In evaluating the census work it had been found that there are probably two major errors in each census: (1) under-enumeration, which resulted in a smaller total population in the censuses than was actually the case; (2) error in mis-reporting of age. After the 1929 census, an official announcement appeared in one of the periodicals issued by the Department of Interior, in the same year, stating that the total number of population in 1929 census was probably slightly lower than the actual population, because of many factors: no compulsion for the citizens to stay at home on the census day, the errors made by the enumerators themselves, and that heads of sub-districts and villages were not sufficiently

2. Actually there is no official count of these tribes. However, from clues in the Development of Self-Help Land Settlements for Social and Economic Development, Bangkok: Department of Public Welfare, 1960, p. 33, which stated that the land settlement project for the hill tribes would be able to help about 50,000, it is estimated that the total number of tribe population would probably not be less than 60,000.

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literate. The under-enumeration in the 1937 census was less than 1%; that of the year 1947 was about 6% (about 1.2 million under-enumeration); and that of the year 1963 was about 2% (about 0.60 millions under-enumeration). It was also found that a large part of the total under-enumeration was of persons from 0-4 years of age. This error was undoubtedly derived from the respondent's failure to tell the enumerators, deliberately or undeliberately, about the children of that age. Error concerning age was also derived from the respondents' failure to tell the exact age, for example, reporting that a child was one-year old while its actual age was 10 months old. In short, it is undoubtedly true that there are some deficiencies in the census data. But there was also a great effort from all involved to improve the work. It is believed that the 1960 census was more accurate than any of the previous censuses. At any rate the census data are the only good source for the analysis of demographic problems. With only slight errors in the data, and with care on the part of those who use them, census data can serve us well enough.

Registration

Under the Recording of Population in the Royal Kingdom Act of 1919, the registration of birth, death, and change of residence was begun in 1909. According to law, births, deaths, and changes of residence are to be registered at the appropriate place, i.e., District Office (Amper) or Sub-District Office (Tambol), or at the municipality as the case may be; and at the appropriate time, i.e., birth - within 15 days; death - within 24 hours; and change of residence - within 15 days. Failure to register at the appropriate place and time carries a penalty. After the said 1909 Act, many Acts and regulations concerned have been issued. At present the registration is carried out under the Population Recording

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Because of the aforementioned legal requirement, one might have a good reason to believe that registration data on births, deaths, and migration would be rather accurate and complete. But, again, many who participated in the population seminar in 1963 believed that the registrations of births and deaths were quite deficient. The error was probably not in the local records, but might be found in the reporting from the local levels to the central government.[3]

Immigration and Emmigration Record

Table 1. Permanent immigrants to Thailand

Year	Estimated * Total Population (in thousands)	Number of ** Immigrants	Percentage of Immigrants to Total Population
1958	24,900	1,447***	.006
1959	25,600	1,136***	.004
1960	26,388	1,869	.007
1961	27,180	1,079	.004
1962	27,995	1,449	.005

Source: * UN Demographic Year Book 1963
** National Statistic
*** Data for Bangkok and Thonburi only.

The authorized agent for immigration and emmigration records is the Division of Immigration, Police Department. An Immigration Act was first enacted in the year 1927. Actually in the past there were not

3. Halvor Gille, "Conclusions of the Seminar", in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, p. 369.

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many immigrants and emmigrants. However, as it had been noticed that the number of immigrants was higher than that of the emmigrants, the Quota of Immigration Act was enacted in the year 1947, to prevent over-immigration. After the quota had been set up the number of immigrants has been considerably reduced.

Incidental Sources

Examples of incidental sources are the population and economic conditions survey made by the Central Statistical Office, Office of National Economic Development Board in the year 1954 and the population survey made by the Ministry of Interior in 1956. The purpose of these surveys was the improvement of population records.

Distribution of the Population

The distribution of population refers to "the physical location of the people, including the manner in which they got there"[4]. The following discussion examines the population distribution of Thailand in terms of: (a) the regional distribution; (b) the areal variations in density; (c) the rural-urban distribution; and (d) internal migration.

The Regional Distribution

The nation is divided into four natural regions: the North, the Northeast, the Central Plain and the South. About 34% of the total population is found in the Northeast; 32% in the Central Plain; 22% in the North; and 12% in the South. Here, it is seen that the large number of people are concentrated in the Northeast and the Central Plain,

4. Francis E. Merrill, Society and Culture: An Introduction to Sociology, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958, p. 245.

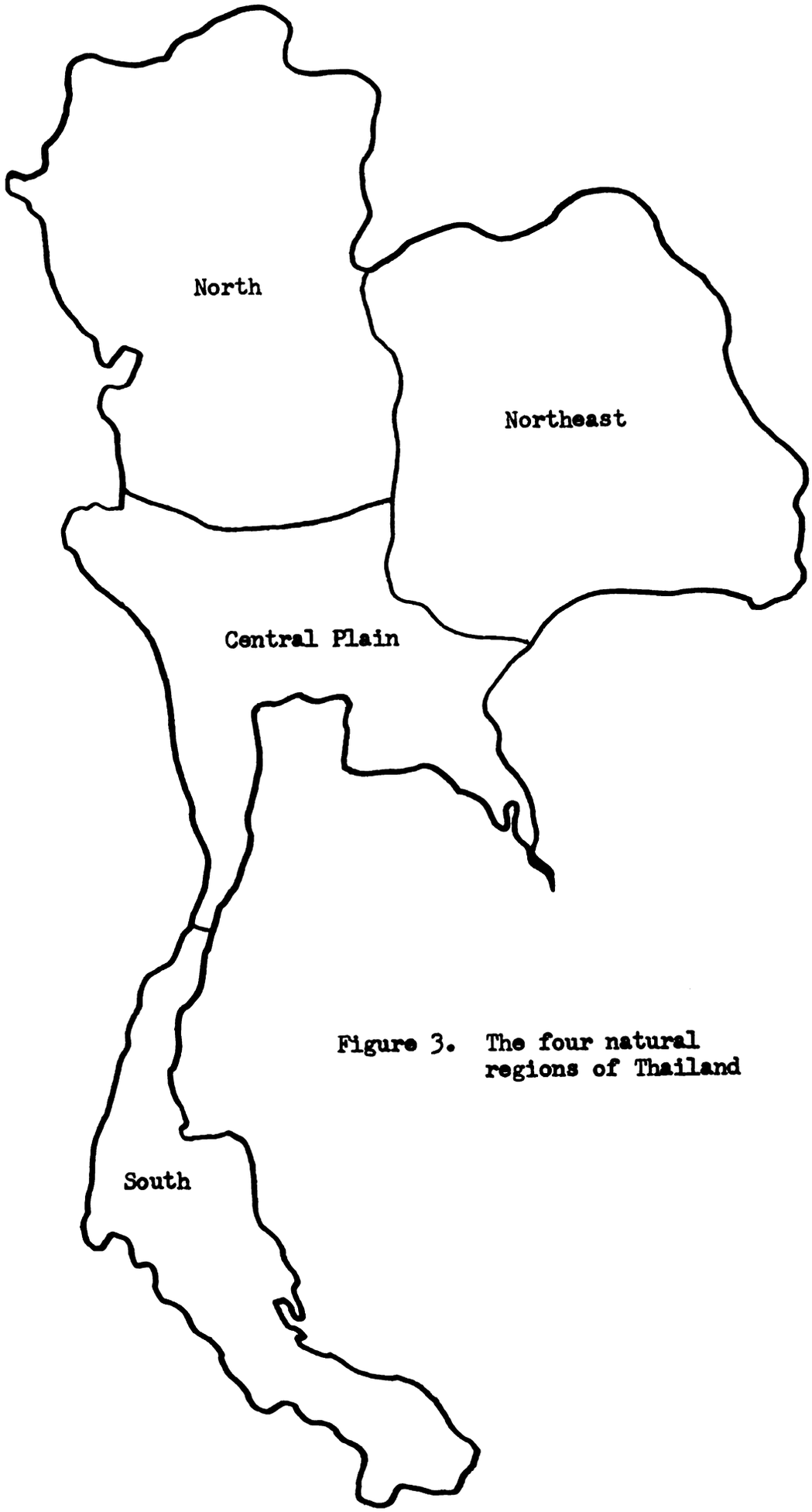

Figure 3. The four natural regions of Thailand

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while the smallest number is in the South. The reason for the small proportion of population in the South are many. Geographically the South has smallest area, i.e., only 70 thousands square kilometers while each of the other three regions has over one hundred thousand square kilometers of land area. Historically, the Thai migrated from the Southern region of China to the present land. The other parts of Thailand were occupied first while the South was the frontier, which, at present is still waiting for more in-migrants. Socio-culturally and economically, the majority of Thais are rice farmers. Most of the land areas in the South are not suitable for rice farming, but are suited for rubber growing and mining in which the Thais have little or no skill. Besides a good portion of the area is occupied by the Malayans (or Thai-Islam) whose culture is too different from the rest of the population (the Malayans are Moslems while the majority of the rest of the Thais are Buddhists). This factor certainly resulted in the retention of many who would like to move to the South.

Table 2. The distribution of population of Thailand by regions

Region	Total Population	Percentage
Nation	26,257,916	100.00
Northeast	8,991,543	34.35
Central Plain	8,271,302	31.68
North	5,723,106	21.76
South	3,271,965	12.21

Source: Population Census of Thailand 1960.

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Areal Variations in Density

Considering the density of population in the four natural regions, that of the Central Plain is the highest, i.e., 80 per square mile; following is the Northeast, with 53 persons per square mile. The density of population of each of the two regions is higher than that of the nation which is 51 persons per square mile. That of each of the remaining two regions is lower than that of the nation, i.e., 47 for the South and 34 for the North. It has to be noted that the North, inspite of its second rank among the four regions in size of area, is less dense than the South whose size of area is the smallest.

Table 3. Density of population of Thailand by regions

Region	Area sq. km.	Density per sq. km.
Nation	514,000	51
Central Plain	103,579	80
Northeast	170,226	53
South	70,189	47
North	170,006	34

Source: Population Census of Thailand 1960.

If the four natural regions are ignored, the density of population may be seen in another pattern. "Very high" (76 persons and over per sq. km.) and "high" (51-75 persons per sq. km.) density of population are to be found in the central and eastern parts of the country. The Western border, some part of the northern border, and almost one-half of the southern part are low in density (1-25 persons per sq. km.).

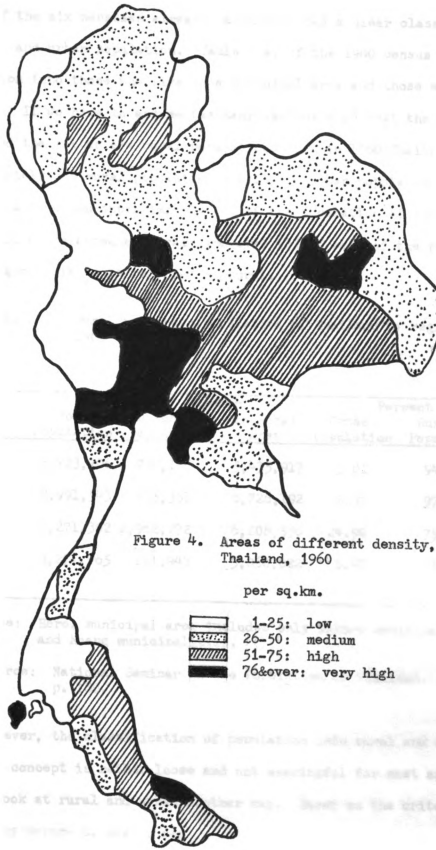

Figure 4. Areas of different density, Thailand, 1960

Rural-Urban Distribution

Of the six censuses already taken none has a clear classification of rural and urban population. Table 1 a. of the 1960 census divided population into those who live in a municipal area and those who live outside. If we have to assume (as many persons did) that the former are urban and the latter are rural population, then in 1960 Thailand had approximately 87% rural population and 13% of urban population. Under the same assumption approximately 75% of the population of the Central Plain will be regarded as rural; and over 90% of each of the remaining three regions, is to be regarded as rural.

Table 4. Rural and urban population of Thailand by region, 1960

Region	Number			Percent	
	Total Population	In Municipal Area	In Rural Area	Urban Population	Rural Population
N	5,723,106	287,188	5,435,917	5.01	94.99
NE	8,991,543	265,351	8,726,192	2.95	97.05
C	8,271,302	2,062,772	6,208,530	24.90	75.10
S	3,271,965	211,943	3,060,022	6.47	93.53

Note: Here, municipal area includes only Nakorn municipalities and Muang municipalities.

Source: National Seminar on the Population of Thailand, 1963, p. 180.

However, the classification of population into rural and urban by the above concept is rather loose and not meaningful for most analyses. We must look at rural and urban another way. Based on the criteria

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provided by Robert C. Bealer and others,[5] it is safe to state that whether occupationally, ecologically, or socioculturally determined, (or all the criteria together), the majority of the population of Thailand is rural. In brief, the explanation is that the great majority of the population earn their living from agriculture. The density is not high. Considering the country as a whole at least half of the total area would be designated as "moderate" and "low" in density. Besides a large number of the villages may be characterized as "isolated". The large majority of population, even in the municipal areas, may be characterized as "gemeinschaft-like".

It has been estimated by Halvor Gille and Thip Chalothorn[6] that only 8.6 percent of the total population of Thailand lived in urban areas in 1960, and the majority of this population (73%) is concentrated in Greater Bangkok. They also stated that urbanization in Thailand is rapidly on the increase as in many other countries.[7] Their assertion seems to be based on the increased number of population alone, particularly that of Greater Bangkok. During 1947-1960 the percent increase was 118. This has to be considered carefully. Neither population growth in a particular area alone is a good index of urbanization of the whole country; nor is the number of population in the municipal areas alone

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5. Robert C. Bealer et al., "The Meaning of 'Rurality' in American Society", in Rural Sociology, Vol. 30, No. 3, September 1965, pp. 255-266.

6. Halvor Gille and Thip Chalothorn, "The Demographic outlook of Thailand and Some Implications", in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, pp. 114-115.

7. For Gille and Chalothorn, an urban area is the area having 20,000 population or more. See Gille and Chalothorn, op. cit., p. 131.

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a precise index for urbanization. Many other factors (as suggested by Bealer) have to be considered also. Actually size of population can be used rather effectively as the index to measure degree of rural and urban in the highly advanced countries such as the United States, but for most of the underdeveloped countries it does not work well. N. Krishnan Namboodiri's research (1966)[8] shows that the situation in India is different from that of the United States; and that population size does not work well as an index to designate rural or urban characteristics of a particular community in India.

Internal Migration

In 1958 Adul Wichiencharoen[9] conducted a study concerning the movement of population within Thailand, based on the data on migration covering the period of 7 years from 1948 to 1954. His investigation confirms Ravenstein's law of short distance moves. It has been found that, of all the migrants, 92.5 percent moved within the same region;[10] and there was no movement between Region IX, the southern-most region, and Region VI in the northern part of the country.

In considering the rural-urban migration it has been pointed out that, with the exception of Greater Bangkok, the movement has always been that between rural areas. The data reveal that 89 out of hundred

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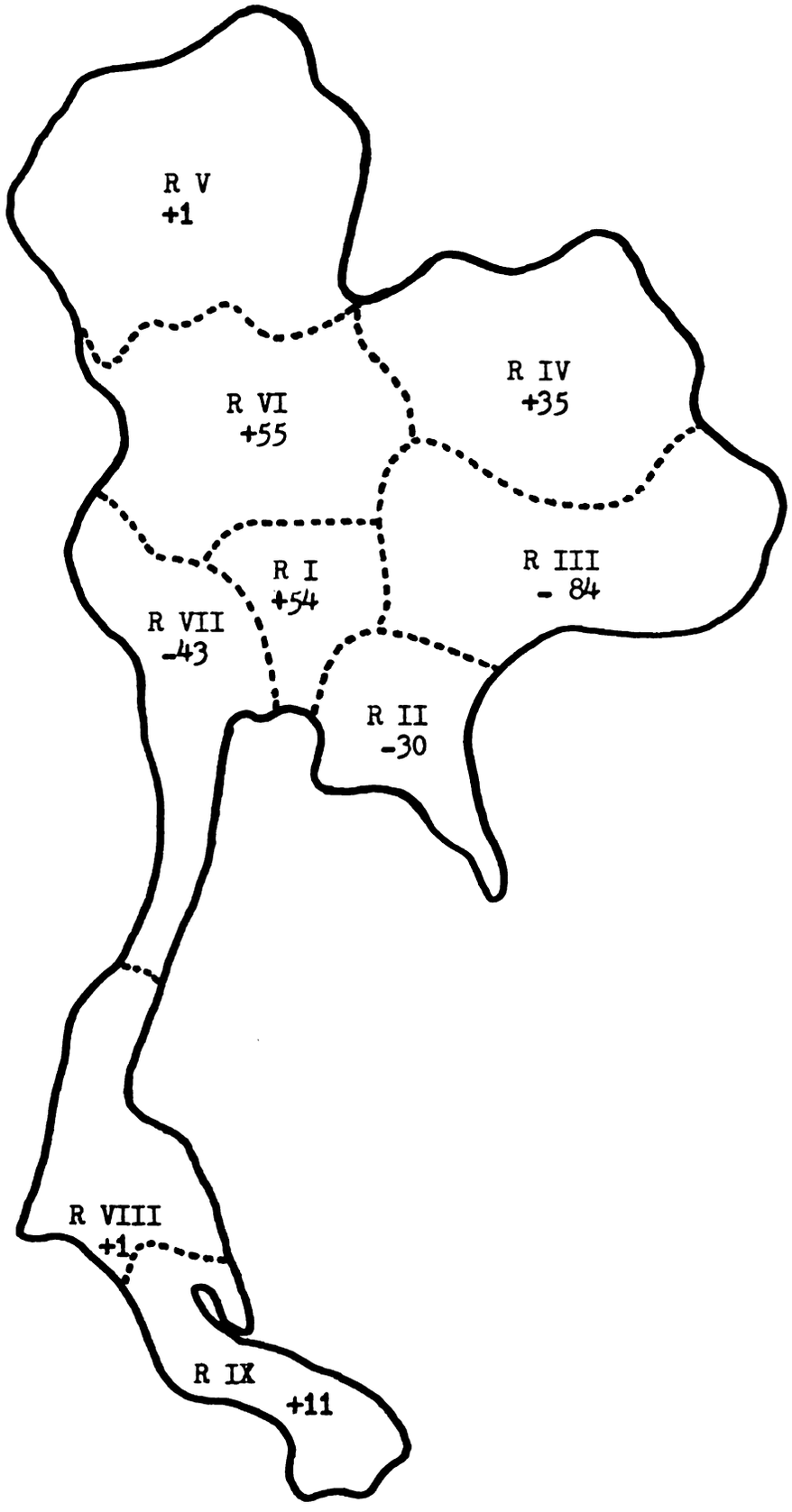
8. N. Krishnan Namboodiri, "A Contribution to the Study of Within-Urban and Within-Rural Differentials" in Rural Sociology, Vol. 31, No. 1, March 1966, pp. 29-39.

9. Adul Wichiencharoen, in 1958, was the Director of Research, Institute of Public Administration, Thammasat University. See Adul Wichiencharoen, "Report on Movements of Population within Thailand", (Memiographed).

10. As used by Wichiencharoen in his study "region" denotes the administrative region - nine of them altogether.

Figure 5. Net migration by administrative region, Thailand, 1958 (in thousand)



migrants moved to rural areas and only 11 moved to urban areas.[11]

Of the total 1.8 million population of the Greater Bangkok enumerated in 1956, 30.02 percent of them were in-migrants. Of every 100 in-migrants, 90 were from the Central Plain; 5 from the Northeast; 3 from the North; and 2 from the South. Leaving aside the short distance in-migration from the Central Plain to which Bangkok belongs, the largest number of in-migration was from the Northeast.

In considering sex ratios, in total the number of male migrants is larger than of females: for every 100 male migrants there are 95 females. It appears that the farther migrants move the higher is the sex ratio. Thus, for every 100 inter-regional male migrants, 76 are females.

Figure 5 shows that large number of migrants are from region III, region VII, and region II, and the regions toward which migrants moved are region I, region IV and region VI. Region I and VI gain most while region III loses most. A portion of migrants move southward to regions VIII and IX.

The implication of the pattern of migration discussed above is that because of the attachment to the physical environment, kinship ties, and low income which makes it difficult to pay for transportation, the movements are largely confined within the same region. Migration to Greater Bangkok can be explained by the fact that Bangkok is the sole social and economic center of the country. The movement means the loss of labor of the "out-migrant" regions and the increase of "urbanized problems" in the Greater Bangkok area caused by the influx of migrants.

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11. The term "urban" has been arbitrarily defined by Wichiencharoen as a municipal area of 2,000 and over households.

Composition of the Population

The composition of the population refers to "the different elements comprising the body of the people",[12] Included in this category are age, sex, religion, educational attainment, marital status, occupational status, income, and minorities. The composition of the population of Thailand will be considered under these categories.

Age and Sex

Thailand is a nation of young people, i.e,, it contains a large proportion of young persons. In 1960 it is estimated that the population in the age bracket of 0-14 amounted to about 44.9 percent of the total population. This proportion is only 5.7 percent less than the active population - those in the age bracket of 15-59 (50.6 percent). If the present trend of population growth, at the rate of 3.0 or 3.2, will continue the proportion of the population in the age-group of 0-14 will undoubtedly increase while the proportion of those in the age-group 15-59 will decrease. It is seen, from Table 5 that the proportion of population 0-14 years of age, which was 42.9 of the total population of the 1950, is expected to increase each year and will reach 45.9 percent in 1980. In contrast, the proportion of those in the age-group 15-59 is decreasing, or from 53.1 in 1950 to 49.3 in 1980.

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12. Merill, op. cit., p. 239, see also Philip M. Hauser and Otis Dudley Duncan, "The Study of Demography" in Philip M. Hauser and Otis Dudley Duncan, eds., The Study of Population: An Inventory and Appraisal, Chicago: The University of Chicago Press, 1963, p. 31.

Table 5. Percentage composition of Thailand's population by broad age-group, 1950-1980

Year	0-14	15-59	60 & Over
1950	42.9	53.1	4.0
1960	44.9	50.6	4.5
1970	45.7	49.5	4.8
1980	45.9	49.3	4.8

Note: All estimates were based on the assumption of constant fertility and moderate mortality decline.

Source: Estimated data of 1950 are from United Nations, Population Studies No. 30, p. 7; and data of 1960-1980 are from the assumptions made by Gille and Chalothorn, in National Seminar on the Population of Thailand, 1963, p. 119.

The median age is an additional indication of how "young" or "old" a population is. The population of Sweden, in 1960, was considered "old" as its median age was 34.6; that of the U.S. was considered "intermediate" as its median age, in the same period, was 29.5; and that of Thailand was considered "young" as its median age was only 18.3. Again, if the present trend of population growth continues, the Thai population in future may be even younger. In 1937 the median age of the Thai population was 18.4; but in 1980 it will probably decrease to only 16.5.

Table 6. Median age of Thailand's population, 1937-1980

Year	Median Age
1937	18.40
1960	18.30
1970	16.55
1980	16.50

Source: Data wherefrom the culculation of the median age of the year 1937 is derived are from Population Census 1937; that of 1960-1980 are from National Seminar on the Population of Thailand, 1963, p. 133.

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Considering the number of each different age-groups living in rural and urban areas the patterns were the same, i.e., in both rural and urban areas the age-group of 0-19 was the largest, followed by the age-group 20-64, and 65 and over respectively.

Table 7. Population in urban and rural areas according to three age-group and sex, Thailand, 1960 (in thousand)

Age-Groups	Urban				Rural			
	M	F	Total	%	M	F	Total	%
0-19	614	592	1,206	52.0	6,844	6,719	13,563	55.0
20-64	537	508	1,045	45.0	5,208	5,233	10,441	42.1
65 & over	31	39	70	3.0	295	370	665	2.9
Total	1,182	1,139	2,321	100	12,347	12,322	24,669	100

Source: Table B. Projection 1, National Seminar on the Population of Thailand 1963, p. 137.

The sex composition of Thailand is usually evenly balanced or close to a balanced condition. The sex ratio in the year 1960 was 100.4; and by 1980 it is estimated, by Gille and Chalothorn, to be about 100 or 101.[13] According to Table 8, the sex ratio of the Central Plain which is 100.8 is close to the national average; and that of the North and the South are higher than national average. The sex ratio of the South is highest, 103.0, and that of the Northeast is lowest, 98.6 The Northeast is the only region having an excess of females over males.

13. Gille and Chalothorn, op. cit., p. 120.

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Table 8. Sex ratio of Thailand by region, 1960

Region	Sex Ratio
Thailand	100.4
Central Plain	100.8
Northeast	98.6
North	101.0
South	103.0

Source: Calculated from data of Population Census 1960.

Considering sex ratio by provinces, of the total 26 provinces of the Central Plain, 13 provinces have low sex ratios. Of the total 16 provinces of the North about one-third of them have low sex ratio. Ninety percent of the provinces in the South have high sex ratio. Hence, the sex ratio of the Southern region is the highest in the country. Most of the provinces in the Northeastern region have low sex ratio, so the whole region has the sex ratio of this type.

The explanation of the low sex ratio of the Northeast is probably its poor economic conditions which results in a considerable number of out-migrants who seek better opportunities in other regions. As a greater portion of migrants are males, a greater portion of females remain. This is compatible with the study of internal migration made by Wichiencharoen previously discussed. Refering to Figure 4, the provinces with especially low sex ratios, i.e., Ubol and four other provinces are in the administrative region III whose loss of population through migration is the highest, i.e., 84 per thousand. The unbalanced sex ratio of the 13 provinces in

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the Central Plain might also be explained in the same way, i.e., many people in these provinces (especially the young) move to Greater Bangkok for educational and economic opportunity.

Considering the sex ratio of rural and urban areas, that of rural is lower. In 1960 the sex ratio of the rural areas is 100.2, and that of urban areas is 103.7. In general, this difference is due to the migration of more males than females from rural to urban areas, for education and jobs. However, explanation is not well verified by the available data. Wichiencharoen's study of internal migration shows only 11 percent of the migrants move from rural to urban areas. In regard to the sex ratio of the aged, i.e., those in the age-group 60 and over, both rural and urban areas show the same pattern of low sex ratios. That of rural is 85.1 and that of urban is 82.0. This can be easily explained by the fact that in general the life span of the females is longer than that of the males.

The age-sex structure of Thailand, comparing 1937 with 1960, reveals a change toward the transitional growth type. From Figure 6 it will be seen that the base of the 1960 age-sex structure is narrower than that of the year 1937 while its top is broader than that of the latter.

In comparing age-sex structures of the four natural regions it is found that that of the Central Plain and the South show more "modernized" characteristic than that of the North and the Northeast. The base of the age-sex structures of the two latter are broader than that of the two former while their tops are narrower.

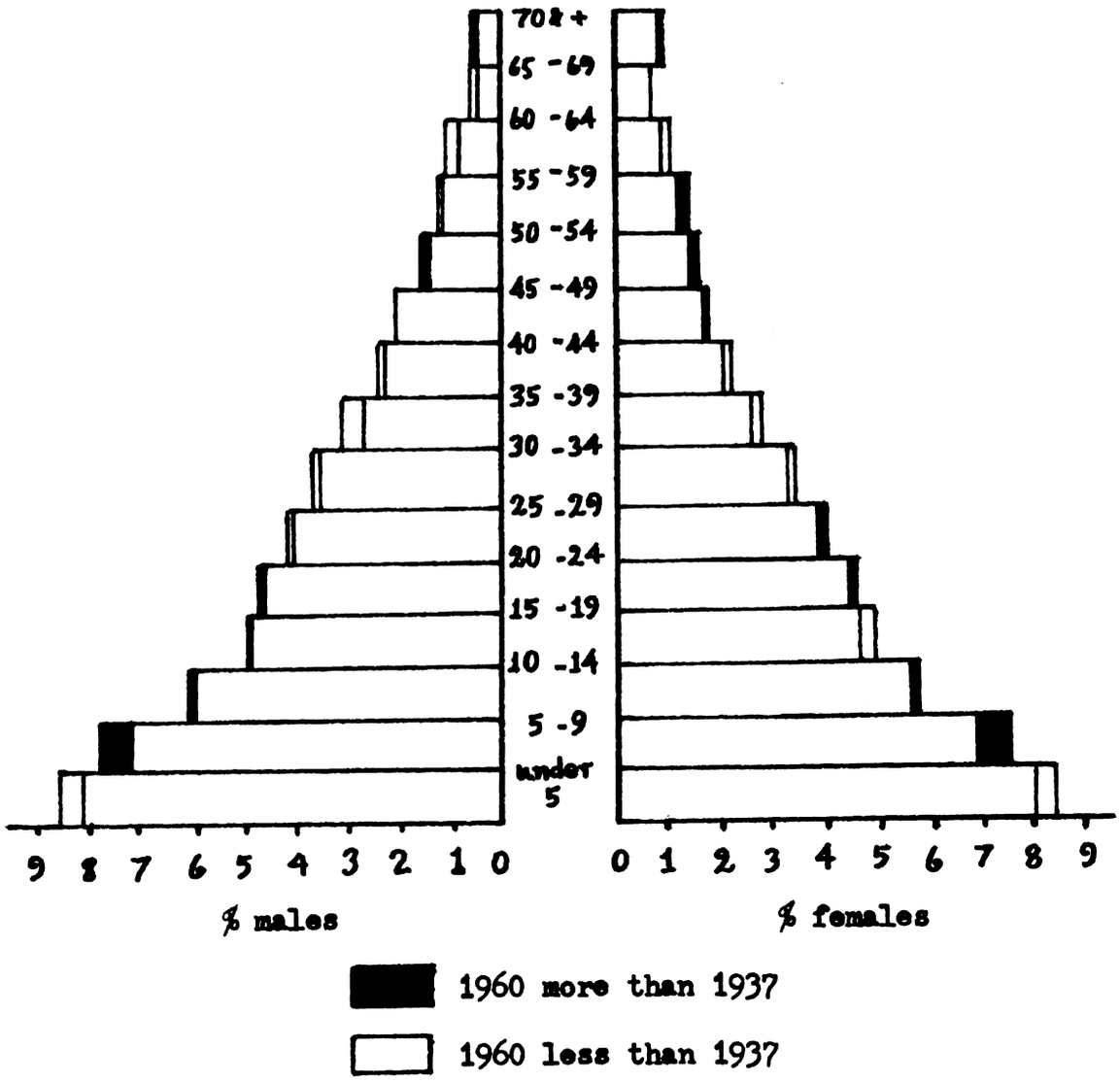

Figure 6. Age-sex structure of the population of Thailand, 1937 and 1960

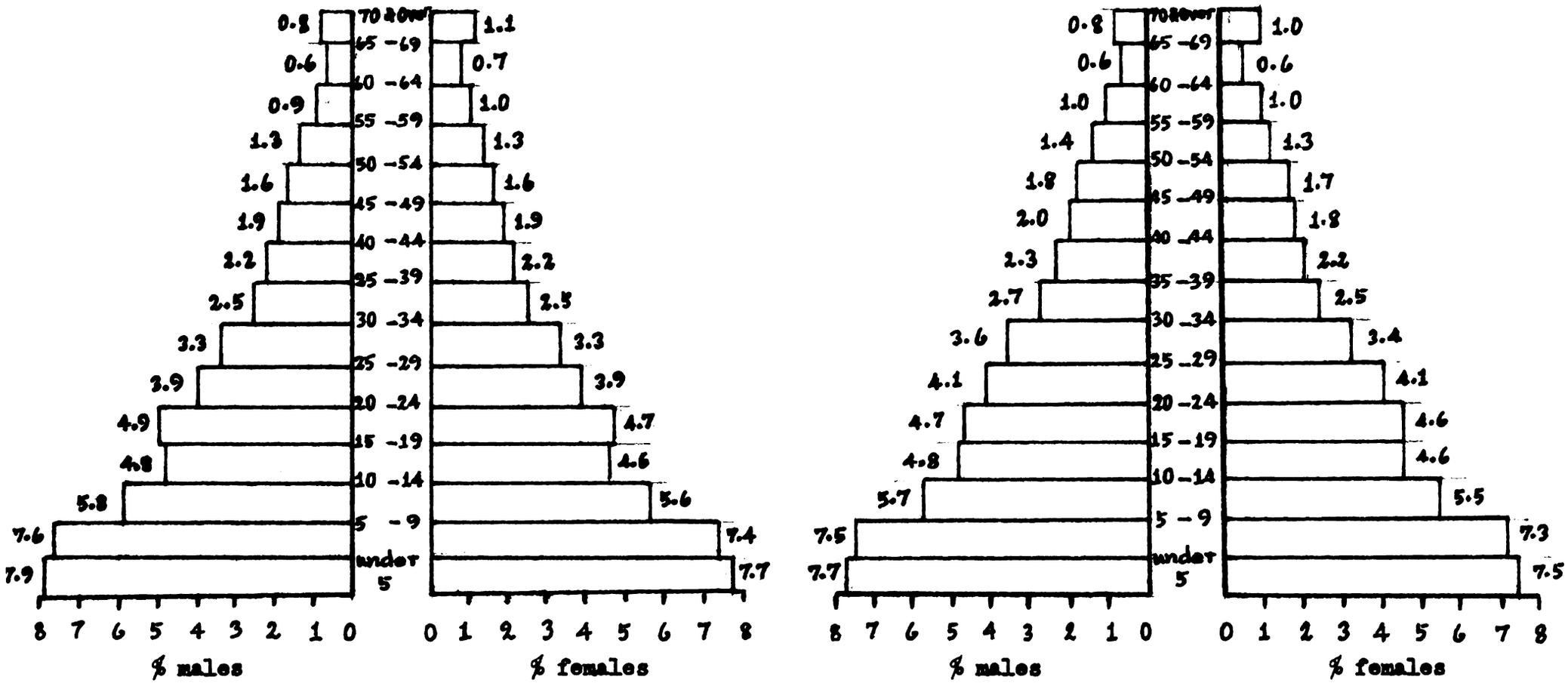

Figure 7. age-sex structure of the population of the Central Plain and Southern regions, Thailand, 1960

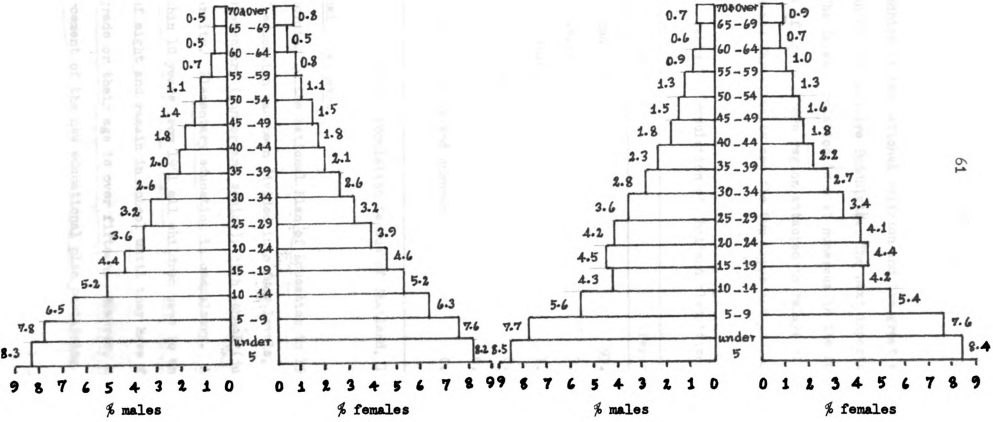

Figure 8. Age-sex structure of the population of the Northeast and Northern regions, Thailand, 1960

Religion

Buddhism is the national religion and the great majority of the population of Thailand are Buddhists. The next important religion is Islam. The Islam population is most numerous in the four southern-most provinces of the southern region attached to Malaya of Malaysia. Confucianism and Christianity are the two important minorities as shown in Table 9.

Table 9. Population of Thailand classified by religion

Religion	Percent
Buddhism	93.6
Islam	3.9
Confucianism	1.7
Christianity	0.6
Others	0.1
No religions and unknown	0.1

Source: Population Census of Thailand, 1960.

Educational Attainment

According to the National Plan of Education in 1960, the present system of education has been divided into four levels, namely kindergarten, elementary (junior and senior), high school (junior and senior), and university. Elementary education is compulsory. According to the plan, within 10 years from 1961 all children have to enter school at the age of eight and remain in school until they have finished the seventh grade or their age is over fifteen. However, up to the present, the enforcement of the new educational plan pertaining to elementary

education has been done in a few provinces only. It seems that there is no possibility of accomplishing this plan within the expected period. The fact is that Thailand lacks school rooms, teachers, and facilities. In actual practice, in most provinces, children have to remain in school until they finish fourth grade.

Schools in the vocational stream are of several types, with courses of different lengths, depending on the character of the trade or profession to be taught. Considerable aid was received from foreign agencies in the establishment and improvement of vocational education. For example, in 1952 the Bangkok Technical Institute was established with the help of the United States Operation Mission (USOM) and Wayne State University. This Institute offers a five-year course after Grade 10 in auto-mechanics, radio, electricity, building construction, carpentry, metal work, machine shop, accounting, secretarial training, retailing, tailoring, home-economics, surveying, printing, photography, and industrial arts. The Thai-German Technical School was set up with the help of the government of West Germany in providing tools and equipment for the training of skilled labor in four areas: auto-mechanics, electrical piping, welding, and machine shop. The Telecommunication Training Center was also set up in the same year with aid from the Japanese Government.[14]

Beside the elementary schools which will be found in almost every village, there are also 19 agricultural schools in different parts of the country. With financial help and services of technical assistants from UNESCO, the Thailand Unesco Fundamental Education Center (TUFEC) had been established at Ubol province. The purpose of this Center is to provide

14. For more details see Abhai Chandavimol, Educational in Thailand, Bangkok: Kan Sassana Publishing House, 1962, pp. 18-21.

education for people living in remote areas and to raise the standard of living of rural people. The people who are in such remote areas also receive education through mobile units of the Ministry of Education who take educational films and mobile libraries to them.[15]

As for education at the university level, Thailand has nine universities. Six are located in Bangkok in the Central Plain and there is one university for each of the remaining three regions. At present there is cooperation between the Thai Government and Michigan State University for the improvement of education in Thailand. Many meetings between some professors of Michigan State University and the key educational officials of Thailand have been held on the M.S.U. campus for such purpose.

Despite such efforts to improve education, the statistical data on educational progress shows unsatisfactory progress. About 93 percent of the population age 11 and over have no more than four-year schooling. Those who have university degrees and those who have completed secondary education (grade 12) account for only 0.16 and 0.87 percent, respectively. Thus, it is obvious that Thailand at present is short of manpower with middle-level and high-level of education, and that unskilled labor is the major component of the work force.

15. Ibid., pp. 19-21. See also Ministry of Education, Education in Thailand, Bangkok: Kan Sassana Publishing House, 1960, p. 13.

Table 10. Educational attainment in Thailand, 1960

Level of Education	Percent
with university degree	0.16
with 12 grades	0.87
with 7 grades	5.85
with 4 grades	51.40
with less than 4 grades	41.72

Source: Non-published material distributed by the Ministry of Education.

Marital Status

Of the total male population 13 years of age and over in 1960, 36.4 percent are single, 56.2 percent are married, 2.9 percent are widowers, 1.6 percent are divorced or separated, and 2.9 percent are unknown as to marital status. Of the total females of the same age, 29.5 percent are single, 56.3 percent are married, 10.2 percent are widows, 3.8 percent are divorced or separated, and 0.2 percent are of unknown marital status.

The percentage of single males is greater than that of the females by 6.9. In other words the percentage of females who "have been married" is greater than that of males. The reasons for this are both economic and social. Economically females have to marry because they are unable to earn sufficient income for living, so they have to depend on males; or they may be able to work but they believe that males are better than they are in many ways. Socially females have to marry at a certain age (approximately 15-20) and failure to do so means disgrace both for themselves

Table 11. Marital status by sex and age-group, Thailand, 1960

Sex and Age-group	Total percentage	Marital Status: Single %	Married %	Widow %	Divorce or separated %	Priest %	Unknown %
Male							
total	100	36.4	56.2	2.9	1.6	2.6	0.3
13-14	100	95.6	0.5	*	*	3.9	*
15-19	100	92.9	2.3	*	0.1	4.4	0.2
20-24	100	64.2	28.4	0.2	1.2	5.3	0.7
25-29	100	25.2	70.0	0.6	2.1	1.7	0.4
30-34	100	8.8	86.9	1.0	2.0	1.0	0.3
35-39	100	4.5	91.1	1.4	2.0	0.8	0.2
40-44	100	3.0	91.6	2.5	2.0	0.7	0.2
45-49	100	2.3	90.5	4.0	2.2	0.8	0.2
50-54	100	2.1	88.0	6.2	2.4	1.1	0.2
55-59	100	1.8	85.0	9.0	2.5	1.5	0.2
60-64	100	1.9	79.4	13.3	2.8	2.3	0.3
65-69	100	1.8	74.3	17.6	2.9	3.0	0.4
70&over	100	1.7	59.3	31.3	3.0	3.9	0.8
unknown	100	18.9	45.4	5.6	3.3	15.6	11.2
Female							
total	100	29.5	56.3	10.2	3.8	-	0.2
13-14	100	99.8	0.2	*	*	-	*
15-19	100	86.1	12.5	0.2	1.1	-	0.1
20-24	100	38.6	56.2	0.7	4.3	-	0.2
25-29	100	14.1	79.5	1.4	4.9	-	0.1
30-34	100	6.7	86.0	2.6	4.6	-	0.1
35-39	100	4.2	86.3	4.7	4.7	-	0.1
40-44	100	3.1	82.6	9.2	5.0	-	0.1
45-49	100	2.5	77.2	15.1	5.0	-	0.2
50-54	100	2.3	67.7	24.6	5.1	-	0.3
55-59	100	2.2	58.2	34.2	4.9	-	0.5
60-64	100	2.1	45.1	47.4	4.6	-	0.8
65-69	100	2.0	35.5	57.2	4.1	-	1.2
70&over	100	1.7	18.5	75.3	2.8	-	1.7
unknown	100	12.1	46.5	23.1	5.3	-	13.0

* The figure is smaller than 0.1 percent.

Source: Population Census of Thailand 1960.

and their parents. However, this does not imply that in Thailand, at present, there is a tendency to marry at the early age as most people believe it to be. On the contrary, the data in Table 6 reveal that the percentage of males married in the age-group of 13-14 is only 0.5; in the age-group of 15-19 the percent is only 2.3; and that of the females at the age-group of 13-14 is only 0.2 and at the age group of 15-19 in only 12.5. Figure 9 shows that it is not until age twenty has been reached that the significant proportions enter into the marriage contract. Females marry somewhat younger than males. The curve for married females reaches a peak at about age fourty, then drops as age advances, slowly at first, but rapidly later on, approximately after the age of fifty-five.

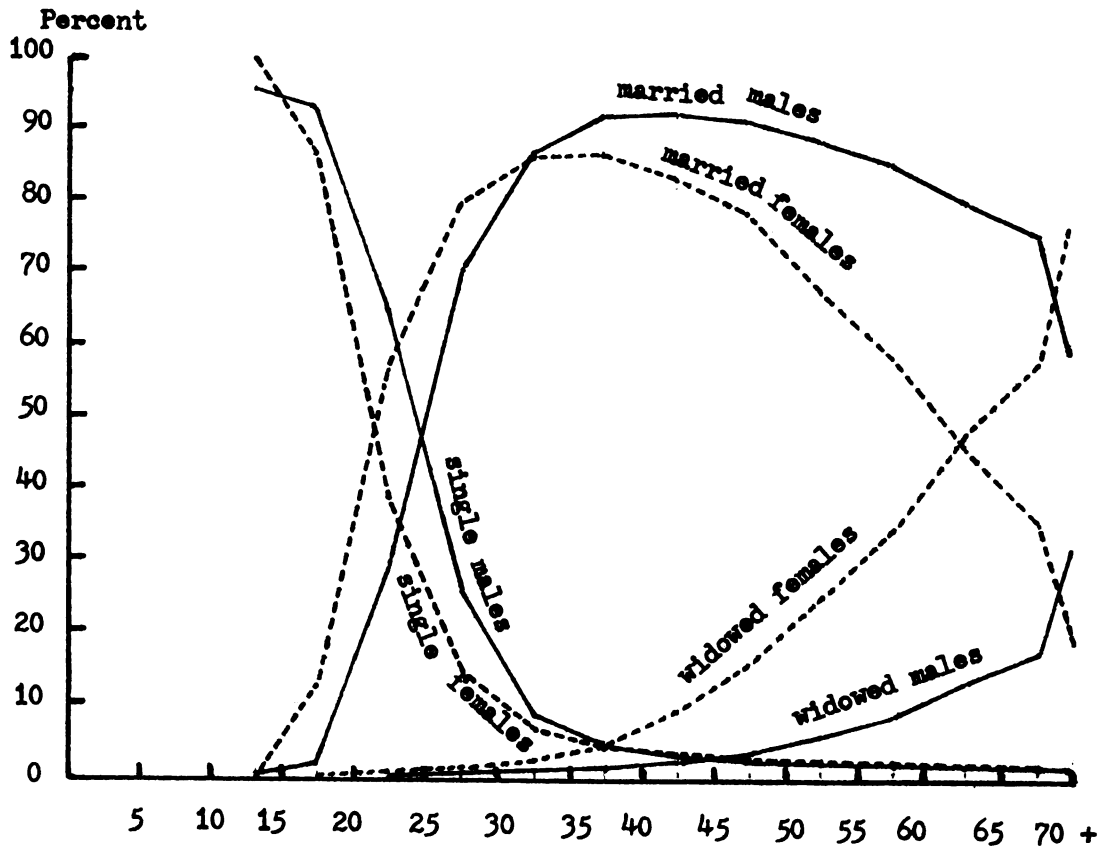

Figure 9. The relationship of age to marital status, Thailand, 1960.

The curve for married males reaches a peak at about age fourty-five, after which it drops slowly as age advances. However, from the age thirty-five on, the curve for married males always lies above that of females. The single curves of both sexes drop sharply after the age twenty. This downward trend proceeds until after the age fourty where the curve remains relatively level.

Occupational and Labor Force Status[16]

Included here are population data of the labor force, the economically active population, the dependent population and occupation, and industry groups in the population. For convenience, in the following discussion, the term labor force will mean all people 11 years of age and over, who at a particular moment, are either employed or unemployed but looking for work (excluded are those looking for work who never worked before).[17] The term "economically active population" will mean those in the age-group 20-64. The term "dependent" includes those who are below 20 years of age and those who are 65 years of age and over. The former will be referred to as the "young" and the latter as the "aged".[18]

16. For details see T. Lynn Smith. Fundamentals of Population Study, Chicago: J. B. Lippincott Company, 1960, Chapter 9; Warren S. Thompson and David T. Lewis, Population Problems, New York: McGraw-Hill Book Company, 1965, pp. 90-93 and pp. 170-171; and also George W. Barclay, Techniques of Population Analysis, New York: John Wiley & Sons, Inc., 1958, pp. 29-32.

17. Definition of "labor force" as used by the Population Census of Thailand 1960.

18. Some writers, for instance, Thompson and Lewis, feel that the terms "labor force" and "economically active population" are synonymous. But, here, they are deliberately used distinguishably for the convenience of discussion.

The Economically Active and the Dependent Population. Underlying the classification of population into the economically active and the dependent is the assumption that in any society, biologically and culturally defined, there are two broad groups of people: "the economically active" (those who produce and consume) and "the dependents" (those who consume but produce none of the economic goods or services). The economically active are assumed to be those in a specific age-group, for example, 11-60, 14-64, and 20-64, in accord with the economic structure of a given society. Those whose age is below the lower limit and above the upper limit of the economically active population are considered dependents. Thompson and Lewis considered the age-group 15-59 to be the economically active population for purposes of international comparison. According to their explanation, though in many societies people are still economically active even beyond 60, in many other societies where health and working conditions are rather poor, very few people are economically active when they approach the age of 60. Barclay prefers the age-group of 15-64, giving the reason that the people of this age-group supply the bulk of the economically active population and includes most of those reporting on occupation.

Those persons in the age-group 20-64 were chosen to represent the economically active population of Thailand for a number of reasons. First, there is no doubt that most people would accept that persons in the age-group 0-10 represent dependents. Second, though the persons of 11-19, according to the census, were included in the labor force, most

of them were actually unpaid workers.[19] Besides, economically and culturally they still depend on their parents and relatives. Out of a total 4.9 millions of persons in the age-group 11-19, approximately 3.1 or 63% were in labor force. This means that 37% were outside the labor force and absolute dependents; and as those 63% in the labor force were unpaid workers, they also should be regarded as dependents. Hence, all persons below 20 years of age should be regarded as dependents.

Turning to the question of the upper limit for the economically active population, at what age is a person too old to work? Due to improvements in health and sanitation, the Thai population is now better off than before, and they are often economically active even beyond 60. Hence, the upper limit is set at the age 64. Those beyond this age limit are considered dependents.

There is a general proposition that a country with a large proportion of the economically active population, ceteris paribus, is economically better off than a country with a larger proportion of dependents. The proportion of the dependents to the economically active population is called the dependency ratio. Youth-dependency ratio is measured by the formula $\frac{\text{number of people under 20} \times 100}{\text{number of people 20-64}}$, and aged-dependency ratio is measured by the formula $\frac{\text{number of people 65 \& over} \times 100}{\text{number of people 20-64}}$. A total-dependency ratio is simply the sum of the youth-dependency ratio and the aged-dependency ratio. A total-dependency ratio above 100, say 105,

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19. Actually there were no data about this. But from the available data in the population census of Thailand 1960, deductive reasoning was employed to arrive at the answer as follow: (1) Ninety-nine percent of the unpaid family workers were those employed in agriculture; (2) eighty-seven percent of the labor force under the age-group 11-19 were employed in agriculture; (3) therefore the majority of the labor force under the age-group 11-19 were unpaid workers.

indicates that in the society under investigation there are 105 dependents for each 100 economically active population; thus it may be referred to as "high". On the other hand, a dependency ratio below 100 may be referred to as "low". This corresponds to Kamerschen's assumption of using total-dependency ratio as an index for measuring the state of non-optimum population, discussed in Chapter II.

Table 12. The three age-group of population and dependency ratios, by regions, Thailand, 1960.

Regions	Percentage of Population				Dependency Ratios		
	total	under 20	20-64	65 & over	YDR	ADR	TDR
Thailand	100	52.6	44.6	2.8	118	6	124
Central P.	100	51.4	45.3	3.3	114	7	121
North	100	51.7	45.5	2.8	114	6	120
Northeast	100	55.1	42.6	2.3	129	5	134
South	100	50.6	46.4	3.0	109	7	116

YDR = Youth Dependency Ratio
ADR = Aged Dependency Ratio
TDR = Total Dependency Ratio

Source: Population Census of Thailand 1960.

The total-dependency ratio of the population of Thailand is relatively high. In 1960 the total-dependency ratio (TDR) was 124; the youth-dependency ratio (YDR) was 118 and the aged-dependency ratio (ADR) was 6.[20] The major component of such a high dependency ratio was the

20. In 1960, the dependency ratio of the United States was 77 (youth 62; aged 15) and that of Brazil was 122 (youth 117; aged 5). Having the U.S. as example of the developed countries and Brazil as an example of the underdeveloped countries, one may get a general idea of how the dependency ratio of an underdeveloped country and a developed country looks like.

high percentage of population under 20 (52.6%). The Northeast whose proportion of population under 20 was the highest (55.1%), had the highest TDR, i.e., 134 (YDR = 129; ADR = 5). Compare the TDR of the Northeast with that of the other three regions, of which even the highest one - that of the Central Plain - was only 121, one will see that the age-sex structure of the Northeast alone had much impact upon the age-sex structure of the whole country. If the TDR of the Northeast could be brought down to level with that of the other regions, the TDR of the nation would be considerably reduced.

Table 13. The three age-group of population and dependency ratios, Thailand, 1960, 1970, and 1980.

Year	No. of Population (in millions)				Dependency Ratios		
	total	under 20	20-64	65 & over	YDR	ADR	TDR
1960	26.3	13.8	11.8	0.7	118	6	124
1970	37.5	21.1	15.3	1.1	131	7	138
1980	53.3	30.0	21.7	1.6	138	7	145

Source: Population Census of Thailand 1960 and the projection made by Gille and Chalothorn in the National Seminar on the Population of Thailand, 1963,,p. 133.

Based on the projection of population made by Gille and Chalothorn, on the assumption of constant fertility and moderate mortality decline, it is estimated that the TDR of Thailand will have an upward trend, i.e, 138 in 1970 and 145 in 1980. The implication is that if the present rate of population growth continues, the future population will be even younger than the present generation, and there will be more dependents in the society, while the number of the economically active population will be

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The number of economically active population (the age-group 20-64) of Thailand was smaller than that of the dependents, either considered in terms of the whole country or of regions. (See Table 12.) That of the country was 44.6 percent. Consider them by regions, that of the South was the highest, i.e., 46.4 percent, and that of the Northeast was the lowest, i.e., 42.6 percent. Here, three points should be noted: First, the major factor contributing to the low percentage of the economically active population was the high percentage of the young (those under the age of 20). The South, because of its low proportion of young, had the highest percentage of economically active population. On the other hand, the Northeast, because of its high percentage of the young, had the lowest percentage of economically active population. Second, since the number of the aged was so small, its influence on the proportion of economically active population was very slight. Third, the percentage of the young had a corresponding relationship with TDR, i.e., when TDR was high, it will be found that it was caused by the high YDR; when TDR was low, it will be found that the YDR was low too. On the other hand, the percentage of economically active population had a converse relationship with TDR; i.e., when TDR was low it will be found that the percentage of economically active population was high and vise versa.

The Labor Force. The term "labor force", as used here, refers to the population actually in the labor market during the period of time under investigation or who were in the labor market before but were temporally unemployed and were looking for work. According to the idea of who should be regarded as old enough to work, a minimum age was set up. Those whose ages were at the minimum level and over were counted. Those

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under the minimum age were excluded, even though they may actually work. There was no maximum age set up for labor force (in contrast to the economically active population for which there were both lower and upper age limits). The persons whose ages were at the minimum level and over, once they had entered the labor market will be considered as the members of the labor force, even at the time of investigation they were not employed (but were looking for work). The persons who never worked before, no matter of what their age, were not regarded as the member of the labor force. The minimum age for labor force varied among different countries. It was as low as 5 years old in case of Egypt (1947); 10 years in Brazil (1950); 14 years in the United States (1960); and 15 years in the United Kingdom (1951). In Thailand (1960) it was 11 years old.

In 1960 the total population of Thailand at the age of 11 and over was 17.3 millions, or approximately 65.9 percent of the total population. Out of the total 17.3 millions, 13.8 millions were in labor force of whom 99.4 percent were employed and 0.6 percent were unemployed. Out of the total 13.8 millions who were in the labor force, 7.1 millions (51.4%) were males and 6.7 millions (48.6%) were females. About 10.5 millions or 76% were in the age-group 20-64.

Occupational Composition. The 1960 census data indicate a large proportion of the labor force in agriculture. Out of the 13.8 million workers in 1960, about 11.3 millions or 82.3 percent were employed in agriculture. The non-agricultural sector employed the remaining 2.5 millions, the relatively large contributors to employment among them were "craftmen, foremen and kindred workers" and "sales workers" which engaged 5.9 and 5.3 percent of the total work force respectively.

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Table 14. Occupational groups of employed persons, *Thailand, 1960 (in thousands).

Occupational Groups	Male	Female	Total	%
Professional, Technical, & Kindred Workers	115	59	174	1.3
Administrative, Executive, & Managerial Workers	23	3	26	0.2
Clerical & Kindred Workers	134	21	155	1.1
Sales Workers	325	410	735	5.3
Agricultural Workers**	5,576	5,758	11,334	82.3
Miners, Quarrymen, & Kindred Workers	19	7	26	0.2
Communicators & Transporters	138	6	144	1.1
Craftmen, Foremen, & Kindred Workers	540	266	806	5.9
Service Workers	152	121	273	1.9
Others	85	14	99	0.7
Total	7,107	6,665	13,772	100

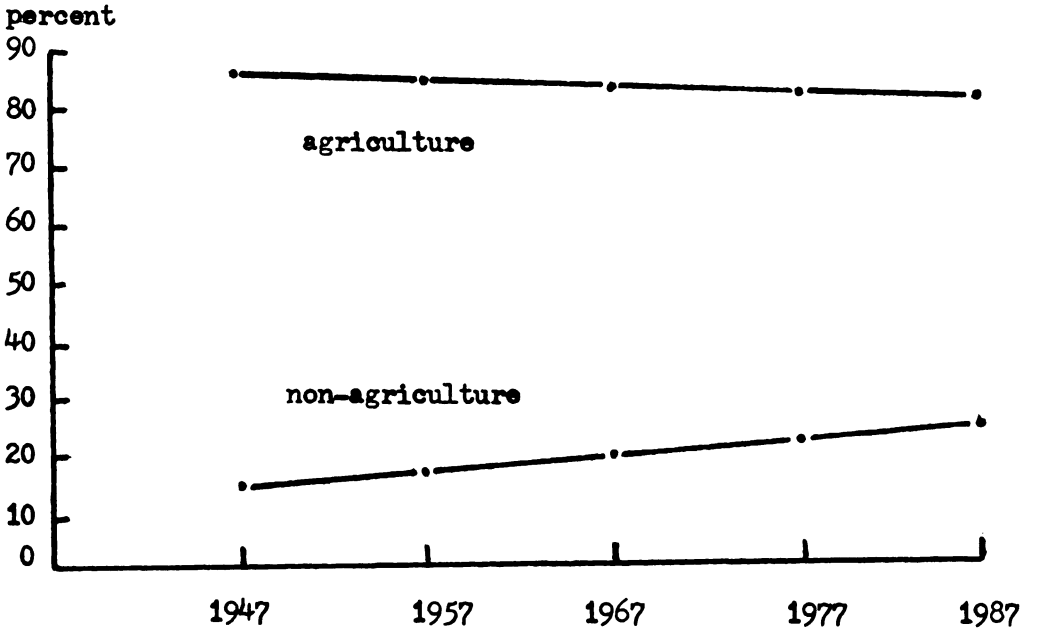
* Employed population eleven years of age and over
** Includes forestry, hunting and fishing

Source: Population Census of Thailand 1960.

Of the ten classified occupations only two of them, i.e., sales workers and agricultural workers have a relatively large proportion of female workers. The number of female workers in agriculture was slightly larger than that of males. Out of 11.3 million workers in agriculture 5.6 millions or 49.6 percent were males and 5.8 millions or 50.4 percent were females.

Data from the past show a gradual shift of employment between agricultural and non-agricultural sectors. Over the period of three decades from 1947 to 1967 agricultural employment declined from 85 percent to 81 percent of the total. It is estimated by the Manpower Planning Office in the National Economic Development Board that this downward trend will continue. According to this report, in 1976 it would probably be 80 percent and in 1986 it would decline to 79 percent.

Figure 10. Percentage distribution of the labor force, Thailand, 1947-1987



Source: Data of the years 1947-1967 were from a study made by A.I.D. team of experts on man power planning, 1963; the projection from 1967-1987 was from the Manpower Planning Office.

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Industrial Composition. The great majority of the labor force (82.3%) were employed in agricultural industries. Commerce, services, and manufacturing were next in the line. In the two industries, i.e., agriculture and commerce, relatively more females than males were employed. In agriculture most of the females were farm laborers and in commerce most of the females were retail traders. In general, in more developed countries, the service industries were the main source of employment for women, but in Thailand, as it is seen in Table 15, more men were employed in service industries than women.

Table 15. Industry groups of employed persons, *Thailand, 1960. (in thousands)

Industry	Male	Female	Total	%
Agriculture **	5,576	5,758	11,334	82.3
Mining & Quarrying	22	7	29	0.2
Manufacturing	294	177	471	3.4
Construction, Repair, Demolition	63	6	69	0.5
Electricity, Water, Sanitation	15	1	16	0.1
Commerce	363	417	780	5.7
Transport, Storage, Communication	157	9	166	1.2
Services	458	197	655	4.8
Others	159	93	252	1.8
Total	7,107	6,665	13,772	100

* Employed population eleven years of age and over
** Includes forestry, hunting and fishing

Source: Population Census of Thailand, 1960

Income

There is a gradual increase in the per capita income of Thailand. Statistical data show the increase from $39 to $60, $75, and $79 in the years 1947, 1951, 1956, and 1960 resepctively. However, when compared with most other countries, per capita income of Thailand is relatively low. For instance, in 1960 the per capita income of Japan and Philippines were $341 and $155 respectively, but that of Thailand was only $79.

Table 16. Per capita income of Thailand and selected countries, 1947-1960, (in U.S. Dollars)

Year	Thailand	Philippines	Japan	Spain	Mexico	Canada
1947	39	-	35	88	128	804
1948	44	121	69	90	136	912
1949	52	112	94	95	146	1,034
1950	60	119	113	116	168	1,033
1951	60	128	149	175	204	1,182
1952	59	126	161	183	220	1,278
1953	65	126	181	188	205	1,300
1954	60	124	189	211	235	1,243
1955	74	128	204	221	288	1,319
1956	75	135	228	250	314	1,433
1957	76	139	253	312	333	1,439
1958	75	145	254	349	358	1,454
1959	79	149	291	364	371	1,518
1960	79	155	341	366	397	1,519

Source: Division of Agricultural Economics, Office of the Under-Secretary of State, Ministry of Agriculture, Agricultural Statistics of Thailand, 1961, p. 158.

The annual income of the farm family is approximately $250.[21] By regions, that of the South is the highest, $392, followed by the Central Plain and the North, $263 and $225 respectively. The Northeast has the lowest figure, or $183. The important factors contributing to the highest income of the farm family in the South are: (1) the abundance of natural resources; (2) high returns from rubber plantations; and (3) high wages. The Northeast, on the contrary, is an arid region with poor natural resources and low wages and thus, has the lowest farm family income.

Table 17. Farm-family income by regions, Thailand 1960. (in U.S. Dollars)

Regions	Annual Income
Thailand	250
Northeast	183
North	225
Central Plain	263
South	392

Source: Chaiyong Chuchart, Agricultural Economics of Thailand, p. 21.

Considering family income in the urban areas, that of the Bangkok and Thonburi municipal area was relatively high, or $912 annually. While the family income of the Northeast was slightly higher than that of the East, the per capita income of the latter was higher due to the fact

21. As the average size of family is six persons, the per capita income of farmers would probably about $42.

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that the size of family of the latter was smaller, thus the individual share of the family income is higher.[22]

Table 18. Family and per capita income in three urban areas, Thailand, 1962. (in U.S. Dollars)

Area	Average Size of Family	Annual Family Income	Per Capita Income
Bangkok & Thonburi Municipal Area	5.5	911.56	165.74
Towns in the Northeast	5.4	653.42	121.00
Towns in the East *	5.1	633.17	124.15

* The East region is usually referred to that part of land situated at the east side of the Gulf of Thailand, approximates Administrative Region II.

Source: Adapted from Table 7.4; 7.5; and 7.6; pp. 104-109 of the Year Book of Labor Statistics, 1965, Department of Labor, Ministry of Interior.

Nationality[23]

Of the total population of 26,257,860 in 1960, 25,787,180 persons or 98.2 percent were Thai; 409,508 persons or 1.6 percent were Chinese; and the remainder 61,228 or 0.2 percent were other nationalities. The last group contained many nationalities, i.e, Vietnamese, Laotians, Burmese Malayan, Indians, Pakistanis, Sinhalese, American, and Europeans. However, the number of each particular group was extremely small.

22. There is no comparison between the four natural regions here because only the data for the Northeast are available.

23. Population Census of Thailand 1960.

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Trends in Population Growth

The Past and Current Population Trends

In 1850 the population of Thailand was estimated by Sir John Bowring to be about 4.5 to 5.0 millions, and by Pallegoix to be about 6 millions.[24] The first population census taken in 1911 indicated a total population of 8.3 millions, and the last census taken in 1960 indicated a total population of 26.3 millions, an increase of about 18 millions within about 50 years. The estimated annual rates of growth during the inter-censal years were as follows: 1911-1919: 1.36; 1919-1929: 2.20; 1929-1937: 2.96; 1937-1947: 1.89; and 1947-1960: 3.22.

Table 19. Trend in population growth, Thailand 1911-1960.

Year	Total Number	Annual Rate of Growth (percent)	Migrated in Migrated out	Natural Growth	Annual Rate of Natural Growth (percent)
1911	8.266,408	-	-	-	-
		1.36			1.20
1919	9,207,355		113,300	9,094,055	
		2.19			1.85
1929	11,506,207		383,684	11,122,523	
		2.96			2.84
1937	14,464,105		126,783	14.337,322	
		1.89			1.78
1947	17,442,689		181,190	17,261,499	
		3.22			3.11
1960	26,257,916		340,289	25,917,627	

Source: Jean Bourgeois-Pichat, "An Attempt to Appraise the Accuracy of Demographic Statistics for an Underdeveloped Country: Thailand" E/CN.9/CONF.2IL.13, United Nations, (1960), p. 29.

24. James C. Ingram, Economic Change in Thailand Since 1850, Stanford: Standard University Press, 1955, p. 7.

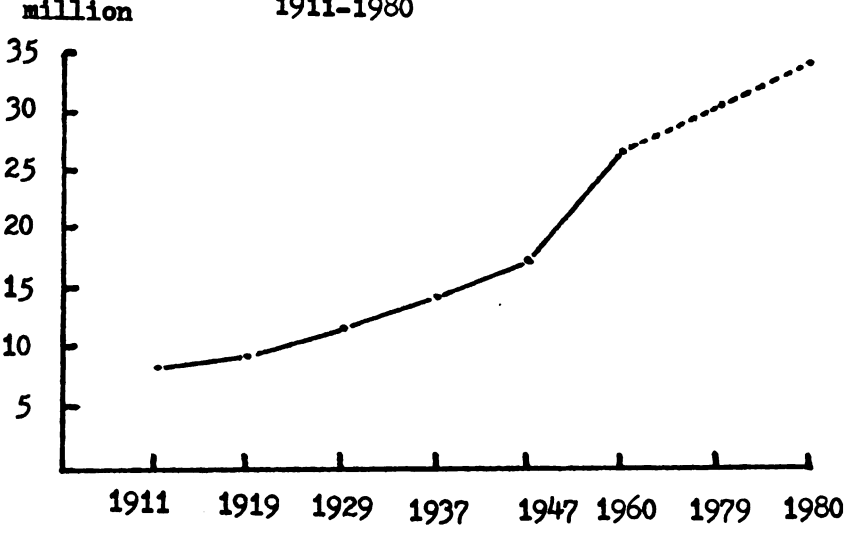
From 1920 to 1963 estimated population are as follows: 1920: 9.5 millions; 1930: 11.8 millions; 1940: 15.3 millions; 1950: 18.5 millions; 1960: 26.4 millions; and 1963: 28.8 millions.

The Future Population Trend

In broad terms, projections of population growth may be divided into two types, simple and complex. The simple type, though it is probably not as accurate, gives a rough estimation of future population which can be used in the consideration of numerous problems when much accuracy is not needed.

Only two factors are needed in the simple estimation, namely, migration and rate of natural growth. In the case of Thailand, since immigration is so small and statistical insignificant, it can be ignored. Only the rate of natural growth is involved. Now, if we assume that from 1960 the annual rate of natural growth of 3.11 percent will continue, we would have an average increase of 500,000 persons each year. Thus, the total population in 1970 would be about 29 millions, and that of the year 1980 would be about 34 millions.

Figure 11. Estimated population growth of Thailand, 1911-1980



The complex projections of population growth take many factors into account, For instance, correction of errors in the present census has estimated first in order to obtain a more accurate population base for further culculation. Mortality rates of males and females of different age-group must be considered in order to know the potential survival of males and females in each age-group. Varying fertility rates should be considered and the number of immigrants and emigrants should be counted.

Projections of the population of Thailand, 1960 to 1980, by complex methods were prepared by Gille and Chalothorn, using as population base the data from 1960 census after various corrections had been made, particularly allowance made for under-enumeration of certain age groups. Future population size was obtained by estimating the number of males and females in each 5-year age group at 5-year intervals, taking into account mortality rates applicable to each age group. Calculations were also made of the number of children that would be born in future 5-year periods and the proportion of these children who would survive at each age.[25]

Gille and Chalothorn's projections were prepared on the following assumptions: (a) No immigration and emigration; (b) Mortality decline either at a continued rapid rate as experienced in recent years or at a rate which is more moderate consistent with past trends in many other countries; and (c) Either no change in fertility or a rapid decline beginning in 1965.

Gille and Chalothorn prepared four sets of the population projections: Projection I - Constant fertility, moderate mortality decline;

25. Halvor Gille and Thip Chalothorn, "The Demographic Outlook of Thailand and Some Implications," in National Seminar on the Population of Thailand, 1963, pp. 116-139.

Projection II - Fertility decline, moderate mortality decline; Projection III - Constant fertility, rapid mortality decline; and Projection IV - Fertility decline, rapid mortality decline. It should be noted that the population of 1960 which was 26,257,916, after the correction by adding 734,000 which, according to Ajit Das Cupta and others, represents under-enumerted children of under 5 years of age, would be 26,99 millions. This was the figure used in the projections.

Projection I: Based on the assumption of constant fertility with moderate mortality decline, the future population would look like this: 27.0 millions in 1960; 31.8 millions in 1965; 37.5 millions in 1970; 44.6 millions in 1975, and 53,3 millions in 1980.

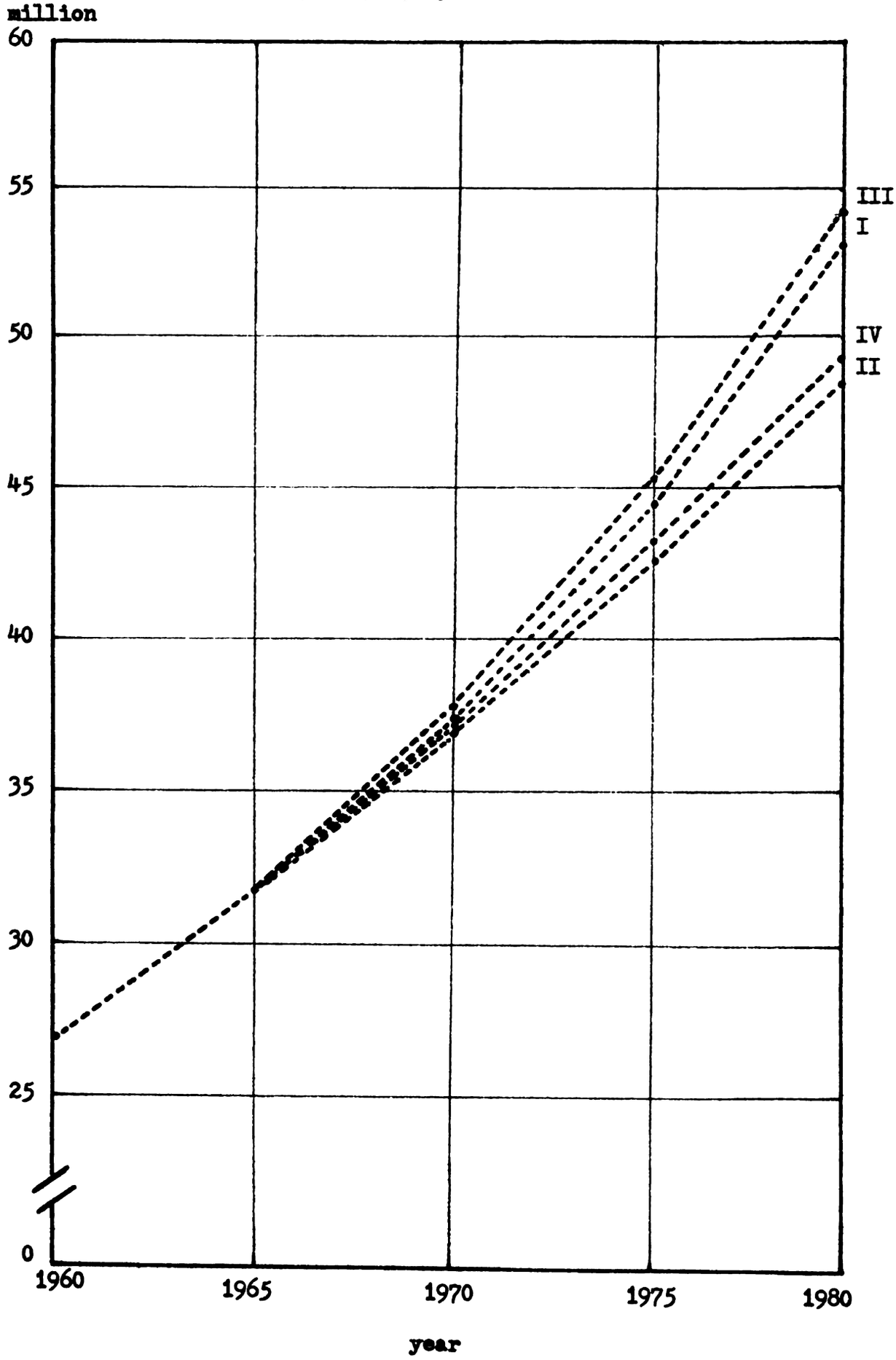
Projection II: Based on the assumption of fertility decline with moderate mortality decline, the future population would look like this: 27.0 millions in 1960; 31.8 millions in 1965; 37.0 millions in 1970; 42.6 millions in 1975; and 48.5 millions in 1980.

Projection III: Based on the assumption of constant fertility with rapid mortality decline, the future population would look like this: 27.0 millions in 1960; 31.8 millions in 1965; 37.9 millions in 1970; 45.2 millions in 1975; and 54.3 millions in 1980.

Projection IV: Based on the assumption of fertility decline with rapid mortality decline, the future population would look like this: 27.0 millions in 1960; 31.8 millions in 1965; 37.4 millions in 1970; 43.2 millions in 1975; and 49.4 millions in 1980.

According to all estimates made by Gille and Chalothorn, then, the total population of Thailand will continue to increase rapidly from approximately 27 millions in 1960 to 48-54 millions in 1980. Regardless of the assumption used, the projections indicate that the population of Thailand will approach doubling within two decades.

Figure 12. Population projection for Thailand, 1960-1980, by Gille and Chalothorn



The Components of Population Change

The components of population change are fertility, mortality, and migration. Each will be considered separately, as applied to Thailand, in the paragraphs to follow.

Fertility

Estimates of the level of fertility indicate that the crude birth rate has been rather constant, in the recent past but is likely to decline slowly in future. One exception has been during the 1940's when the rates were abnormally low because of the effect of the war and early post-war condition.[26] Crude birth rates are shown in the following table:

Table 20. Crude birth rates, Thailand, 1950-1980

Date	Rate per 1,000
1950-1955	41.1
1955-1960	47.2
1960-1965	46.2
1965-1970	44.8
1970-1975	44.1
1975-1980	44.1

Source: United Nations, Population Studies No. 30.

The fertility rate of 40 and over, the rate of many of the under-

26. The effect of war caused the unusual increase in the rate of mortality during the same period.

developed countries, is considered high. In 1964 the crude birth rate of most of the developed countries was below 25 per thousand. For instance, the crude rate of Canada, United States, and France were 24.8. 21.6, and 18.2 respectively, while that of India, Thailand, and Nigeria were 43, 44, and 53 per thousand, respectively.[27]

The average number of children produced by mothers in most of the industrial countries during their reproductive period was approximately 2 or 3. For Thailand, according to the Population Census 1960, the average number was 6, while that of many other underdeveloped countries was 5.[28]

Mortality

Table 21. Crude death rates, Thailand, 1950-1980

Date	Rate per 1,000
1950-1955	24.1
1955-1960	21.8
1960-1965	19.6
1965-1970	17.5
1970-1975	15.8
1975-1980	14.2

Source: United Nations, Population Studies No. 30.

27. Population Reference Bureau, 1964.

28. Anuree Chintakananda, The Impact of Rapid Population Growth on the Age-Sex Structure, Paper presented to the Second National Seminar on the Population of Thailand, October 11, 1965.

The crude death rate of Thailand shows a downward trend. The rate of 31 per thousand during 1930 and 1934 was reduced to 28 during 1935 and 1939;[29] 24.1 during 1950 and 1955; 19,6 during 1960 and 1965; and it is estimated to be 14.2 during 1975 and 1980.

The reduction of the mortality rate results from the improvement of public health practices and medical technology, aid from the Western countries, and the extension of medical care and health education into the rural areas.

The principal causes of death in Thailand were diseases of early infancy, pneumonia, diarrhea and enteritis, T.B. or respiratory system, and malaria. According to the available data, up to the year 1958 the number of death from diseases of early infancy and malaria had been greatly reduced.

Table 22. Death rate by principal causes, Thailand, 1958.

Principal Causes	Rate per 1,000
Diseases of early infancy	68.2
Pnenumonia	41.4
Diarrhea and Enteritis	41.3
T.B of respiratory system	40.5
Malaria	40.2

Source: Department of Health, Ministry of Public Health, Health Progress 1959-1960, THAILAND, p. 17.

Considering the infant death rate, it was estimated by the

29. National Seminar on the Population of Thailand, 1963, p. 115.

Department of Health that 50 years ago the infant death rate exceeded 300 per thousand live-births. The rate was reduced to 91.1 in 1938. the substantial downward trend from 1938 to 1958 was spectacular as shown in Table 23.

Table 23. Infant death rate, Thailand, 1938-1958

Year	Rate per 1,000
1938	91.1
1948	68.1
1949	65.9
1950	62.4
1951	56.3
1952	62.8
1953	64.9
1954	63.5
1955	56.1
1956	55.2
1957	62.2
1958	54.2

Source: Department of Health, Ministry of Public Health, Health Progress 1959-1960, THAILAND, p. 55.

The reduction of the death rate from Malaria is also spectacular. The rate dropped to half within 5 years, and to one-fourth within 7 years. The annual reduction is shown in the following table.

Table 24. Malaria death rate, Thailand, 1950-1958

Year	Rate per 100,000
1950	195.0
1951	183.4
1952	153.5
1953	111.4
1954	84.2
1955	73.1
1956	56.7
1957	45.7
1958	39.2

Source: Department of Health, Ministry of Public Health, Health Progress 1959-1960, THAILAND, p. 23.

Eradication of malaria was one of the main operational targets of the Ministry of Public Health in Thailand. The malaria eradication program was launched in 1958 and in 1959 it was conducted in 60 provinces in which about 14 million population resided. If the program has been carried out effectively according to the operational target, malaria should now be virtually eradicated.

As for the rest of the three principal causes of death, there has been slow but fluctuating, downward trend for diarrhea and enteritis and T.B. of respiratory system. But in general, the rapid reduction of the mortality rate within recent years should be credited largely to the reduction in the diseases of early infancy and in malaria.

Table 25. Death rates per 100,000 from diarrhea and enteritis, T.B. of respiratory system and pneumonia, Thailand, 1954-1958

Causes of Death	1954	1955	1956	1957	1958
Diarrhea & Enteritis	56.8	48.3	42.3	56.6	41.3
T.B. of Resp. System	51.6	52.3	45.6	48.6	40.5
Pneumonia	31.2	37.8	41.8	54.1	41.4

Source: Department of Health, Ministry of Public Health, Health Progress 1959-1960, THAILAND, p. 94.

Various health programs and operations are being carried on to reduce the mortality rate in Thailand, There was an expansion of the tuberculosis control service. Two branch clinics were opened, one at the T.B. Association in the northern section of Bangkok, and the other in Chiengmai province. The latter is to be a nucleus for tuberculosis control campaign in the northern part of the country. Two mobile T.B. control units were organized to serve the people in some sections of Bangkok and Thonburi. Tuberculin testing and the B.C.G. vacination were carried out among the school children as well as the general public.[30]

To reduce the infantile and maternal mortality rates various measures have been carried out. Special courses for the training of "second category midwives" were organized to provide those in the remote areas with sufficiently skilled persons, Two model mother and child health centers were constructed in 1952, one in Bangkok, the other in

30. Department of Health, Ministry of Public Health, Health Progress 1955-1960, THAILAND, pp. 35-39.

Chiengmai. The purpose is to facilitate demonstrating and training of health personnel, especially student midwives and student nurses. The centers also serve as preventive and curative health stations for mothers and children. In 1950, two mobile Mother and Child Health units were organized to help the mothers and children in isolated areas, which cannot be reached by midwives stationed at permanent centers. A preventorium for children was opened at Nonburi province in 1955. Its purpose is to isolate and to immunize the children from tubercular families.[31]

The local health development program was started in 1953 in different localities. The aim was to demonstrate ways and means of improving the rural health services under varying circumstances. According to the program, each 50,000 population will be provided with a first class health center under which is a chain of second class and midwifery centers - about 10 in number, each serving about 5,000 population in the area. In 1958 such health units were expanded to 10 localities. Since 1957 a 52-week training course for the health workers was given at Cholburi Training Center. A completely new project called the Village Health and Sanitation Development Project was begun in 1960. The aim is to carry out a nationwide campaign for controlling diseases associated with poor sanitation, by giving all 50,000 villages of the country an opportunity to improve sanitation by providing for each household a sanitary privy, a safe domestic water supply, and a more sanitary environment. A village health committee was organized in each village to carry on the program in their own village. Intensive health education was given to the villagers through health committees. Before the end of 1960 the program had been expanded to 411 villages. In adition to

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31. Ibid., pp. 55-60.

the work carried out by various projects mentioned above, there are at least two additional mobile units in the Northeast, one is the military Mobile Development Unit (M.D.U.) and the other is the civilian mobile unit called "Accelerated Rural Development (A.R.D.)". Both operated in much the same way - built roads, dug wells, helped farmers improve crops, cure the sick, etc. The operation of both units was under the protection of the Civilian-Police-Military unit (C.P.M.).[32]

Assistance was received from many international organizations to carry out the various programs mentioned above, in the provision of experts, equipment, or in money. Examples of these international organizations are; WHO, UNICEF, FAO, USOM, COLOMBO PLAN, and AID. AID gave general assistance in the development of the local health development program. WHO provided expert service for the control of yaws, tuberculosis, and leprosy, in vital statistics, trachoma survey, etc. UNICEF supplied equipment for many health programs in collaboration with WHO assistance. FAO provided expert service in the field of nutrition education. USOM provided expert service and supplied equipment for malaria eradication, community health development, and health education. COLOMBO PLAN awarded fellowships and supplied equipment for health education.[33]

Life Expectancy

Life expectancy of the population shows an upward trend. During 1937 and 1938 life expectancy of males at birth was 36.73; by 1947-1948 life expectancy had risen to 48.69. In all age groups, life expectancy

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32. National Geographic. Vol. 132, No 1, July 1967, p. 120.

33. Department of Health, op. cit., pp. 14 & 72.

for females was higher than for males. Life expectancy of different age groups is shown in the following table:

Table 26. Life expectancy for Thailand by sex and age, 1937-1938 and 1947-1948

Age Group	Year 1937-1938 Male	Female	1947-1948 Male	Female
0	36.73	43.30	48.69	51.90
10	45.40	51.01	47.87	50.90
20	36.50	42.41	39.81	42.71
30	29.34	35.75	32.53	35.44
40	22.89	29.86	25.56	28.43
50	17.13	23.50	19.00	21.30
60	12.38	17.43	12.69	14.20
70	8.50	11.43	6.34	7.42
80	5.25	6.65	*	*

* Data are not available.

Source: United Nations, Demographic Yearbook, 1948 and 1958.

As shown in Table 26, life expectancy at birth rose significantly for both males and females between 1937-38 and 1947-48. However, except for female life expectancy at ages 0 and 20, the expectancy figures were higher in the earlier of the two periods.

The Relationship between Birth Rate and Death Rate

As mentioned previously, migration is not significant for the consideration of population change in Thailand. For this reason only

fertility and mortality are considered here. The natural increase rate starting in 1933 and projected to 1978 os summarized in Table 27.

Table 27. Curde birth rate, crude death rate, and natural increase rate, Thailand, 1933-1978

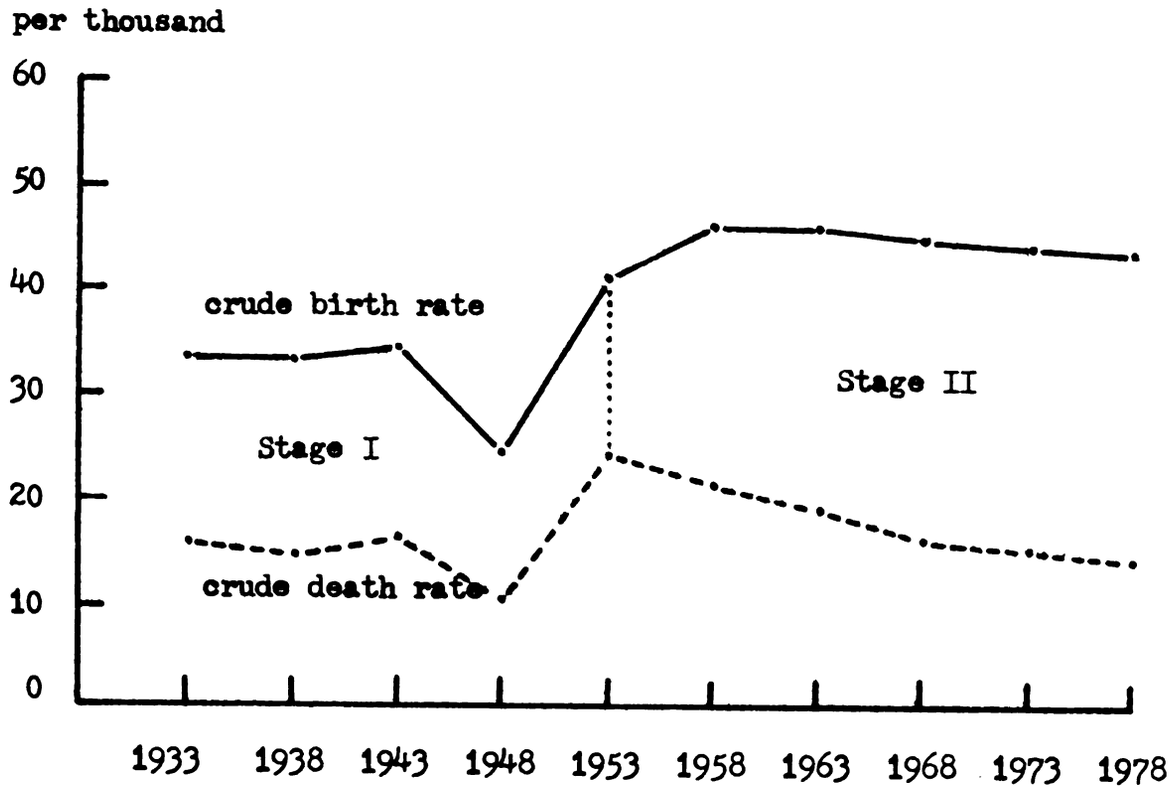
Year	Crude Birth Rate	Crude Death Rate	Natural Increase
1933	34.8	16.6	18.2
1938	33.5	15.1	18.4
1943	35.1	17.7	17.4
1948	23.9	10.7	13.2
1953	41.1	24.1	17.0
1958	47.2	21.8	25.4
1963	46.2	19.6	26.6
1968	44.8	17.5	27.3
1973	44.1	15.8	28.3
1978	44.1	14.2	29.9

Source: United Nations, Demographic Yearbook, 1948 and 1953; United Nations Population Studies, No. 30.

From 1953 the gap between the birth and death rate expanded as the birth rate rose in 1953 and declined slightly between 1953-1967. Starting with 1968 it is estimated to be quite stationary for al least fifteen years. From 1953 onward the death rate shows a declining trend. From this picture it can be stated, in terms of the theory of the demographic transition, that presumably the population of Thailand was in the Pre-industrial stage (Stage I) until about 1952. The Pre-Western stage (Stage II) began around 1953 and still continues. At present

Thailand probably stands in the midst of Stage II. Thus the wide gap between the birth and the death rate will, in the near future, probably remain for a length of time before it narrows, either due to positive checks, (according to Malthusian theory), to the decrease in birth rate and the increase in death rate, (according to the theory of logistic curve of population growth) or due to pertinent population policy, for instance, effective family planning. See Figure 13.

Figure 13. Crude birth rate, crude death rate, and natural increase rate, Thailand, 1930-1978, revealing stages of transitional growth



CHAPTER IV

THE CONSEQUENCES OF POPULATION GROWTH

> "Abundance can never be permanent in a world where there is a constantly increasing population, since, as the population grows, even the greatest supplies become inadequate."[1]

In general, population growth by itself cannot be evaluated positively or negatively. The question must be considered in relation to time, space, and other factors, such as available capital and existing technology. Within a given area an increase in population, especially at a rapid rate, will undoubtedly, at a certain point in time, exert a pressure on the resources so that inadequate resources will be the ultimate result. Actually technology can be improved but it cannot be sure that its improvement is unlimited. Besides, it is usually difficult for production to keep pace with the rapid growth of population. Another word indicating a certain physical area can replace the word "world" in Prentice's statement cited above - village, county, state, nation, etc. - the statement will still hold true.

According to the 1960 census the population of Thailand was 26.3 million. After correction for some under-enumeration is made the population at the census date would be around 27 million. The current rate of population growth, as estimated by many sources, ranges from 2.8 to 3.4 percent per year. For convenience the rate of growth has been often said

1. E. Parmalee Prentice, Food, War and Future, New York: Harper & Brothers, 1944, p. 20.

to be around 3 percent a year. In fact, only a few Asian countries have a higher rate of population growth than this. We have to accept the fact that the population growth of Thailand is at present at a high and unprecedented level. Such a high rate of growth unabated will lead to problems, both economic and social, in the near future.

The Consequence of Population Growth on Economic Conditions

The Shortage of Land Per Person

In the year 1960 when population of Thailand was about 27 million, and the area of the country was about five hundred thousand square kilometers, there were about 18,519 square meters of "standing room" for each person. Assuming that the population growth rate at present which is around 3 percent per year continues, the population will double every 23 years. Within a century, (in 2060) the population would rise to about 547 million, and the "standing room" for each will be reduced to 914 square meters. Another century from the year 2060 would bring the total number of population up to about 5,017 million, and the "standing room" for each would be reduced to only about 100 square meters - the size of a small apartment. How intense the economic and social problems would be if such pressure on space would occur! As land is one of the factors of production, the more scarce it is the more problems with which a society has to cope.[2]

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2. The constantly rapid population growth has a high potential of causing problems not only to own society, but to the world as well. See Karl Sax, Standing Room Only: The World's Exploding Population, Boston: Beacon Press, 1963.

The Shortage of Food Supply

In Thailand there is an old saying: "There are fish in the water; there are paddies in the fields." A generation ago, when population was about 15 million this old saying held true. But at present when the population is around 34 million many people would hesitate subscribe to the optimism in this saying. There are still paddies in the fields, but land is now relatively limited for extensive farming. And besides, yields per acre on many farms are declining due to the exhaustation of the soil. It is generally accepted that fish in natural waters are not as abundant as they were before and in many places it is even difficult to find any fish. Thus, the high confidence about abundance is declining. However, the Thais still feel that they always have enough food to eat. This feeling is reflected in a part of the statement made by Rama VII thirty-five years ago that, in Siam even the dogs have never been starved. If the present trend of population growth continues, at a certain time in future, it is doubtful whether the words of Rama VII would still hold true. Moreover, as the economy of Thailand depends on rice export, the problem of food production might be more serious, as she has to produce more to feed the increased population and at the same time for export. However, as a special discussion about food production will be given in Chapter VI, we will drop our discussion of this problem at this point.

The Problems Concerning Employment

In the report of a mission from the International Bank for Reconstruction and Development to the Government of Thailand in 1960, there was a suggestion about problems which might derive from the rapid rate of population growth. Among these problems, unemployment was the one

which the mission thought would become serious in the future.[3]

However, according to the 1960 population census, unemployment amounted to only 0.6 percent of the labor force. Also the 1963 labor survey indicated that in the municipal areas the unemployed amounted to only 6.2 percent of the total labor force.[4] Considering these data, is it possible that the suggestion made by the mission from the International Bank for Reconstruction was wrong?

Actually the low percentage of unemployment was due to the fact that there was a high proportion of unpaid family workers, especially in the agricultural sector. According to the 1960 population census, the unpaid family workers were approximately 58 percent of the total number of persons in the labor force. In addition, the problem of under-employment was found in Agriculture. Information from the Ministry of Agriculture indicated that the annual number of work-days of Thai farmers was only 150.[5] With the growth of population, the future labor force will become larger than present. It is doubtful whether there will be sufficient land for these new farmers, assuming that the majority of the labor force will still remain in the agricultural sector.

The total area of Thailand is approximately 128 million acres. Half of the total area, or 64 million acres are forest lands, including mountains; 32 million acres are used for residential land (including

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3. Sangad Plengvanij, "Reports on Family Planning in Japan and China" in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, pp. 456-457.

4. Department of Labour, Ministry of Interior, Year Book of Statistics, 1965, p. 141.

5. Chaiyong Chuchart, Agricultural Economics of Thailand, Bangkok: Mongkol Kanpim, 1960, p. 14.

streets and highways); the remaining 32 million acres, or 25 percent of the total land area, are used for agriculture, of which 20 percent are cultivated lands and only 5 percent of this portion of land is left uncultivated.[6] It will be seen that there is only a small portion left to be cultivated. The shortage of land for future farmers will obviously be a major future problem. Since agriculture needs land, sufficient land for agriculturists means sufficient work for them; on the other hand, a shortage of land means unemployment. Some may argue that any surplus of labor in the agricultural sector can be shifted to the industrial sector. But considering the over-all economic situation of the country it is likely that in 1980, even if all the surplus labor in the agricultural sector will have skill required for industrial work (which is hardly expected to be so), there will still not be enough industrial plants to provide enough jobs for the surplus labor from the agricultural sector for many reasons, insufficient investment being the major one.

In addition to the probable unemployment due to the shortage of land for the future farmers, there might be unemployment among the youth who will graduate from schools of different levels, approximately 600,000 persons per year. Past data reveal that about four to five hundred thousand of these persons had 4 years of schooling only. A labor survey made by the Labor Division in the Department of Public Welfare indicates an unemployment of about 40 to 45 percent among the graduates from vocational schools within the period of 8 to 12 months

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6. Prakrit Bhamonchant, "The Future Agriculture of Thailand and the Population Growth", in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, p. 502.

after their graduation.[7] Thus, it may be concluded that the problem of unemployment in the future is probable if the present trend of population growth continues.

Per Capita Income

The relationship between population size and per capita income is one aspect involved in the theory of optimum population. Actually it is very difficult to determine whether a given population is larger than one yielding maximum per capita output, because many factors other than size of labor force are involved in production. For instance, capital, available techniques, and the skill of individuals in the labor force are important variables. A population with a certain level of skill may be in a stage of diminishing return, whereas the same size of (later) population with higher skill and better technique in production might be of optimum or even sub-optimum size.[8] However, in an underdeveloped country the increase of accumulative investment, level of education, skills, and techniques tend to be very slow in comparison with the rate of population growth. Thus, a rapid increase of population might result in an over-population, i.e., the increase of output may be proportionately less than the increase of population. Output per capita decreases. Wages also will decrease. Thus, per capita income is lower than before.

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7. Nikom Chantravitura, Situation and Problem of Employment in Thailand, a paper presented to the Second National Seminar on the Population of Thailand, 1966, (Mimeographed.), p. 7.

8. Ansley J. Coale and Edgar M. Hoover,, Population Growth and Economic Development in Low-Income Countries: A Case Study of India's Prospects, Princeton, New Jersey: Princeton University Press, 1958, pp. 18-19.

Table 28. Estimated midyear population and per capita income, Thailand, 1951-1960

Year	Midyear Population (million)	Per Capita Income ($)
1951	19.8	60
1952	20.3	59
1953	20.9	65
1954	21.5	60
1955	22.1	74
1956	22.8	75
1957	23.4	76
1958	24.1	75
1959	24,8	79
1960	25.5	79

Source: Population: United Nation Monthly Bulletin of Statistics, October, 1962; Per Capita Income: Division of Agricultural Economics, Office of the Under-Secretary of State, Ministry of Agricluture.

From Table 28, it will be seen that there is a positive relationship between size of population and per capita income. The coefficient of correlation between the two variables is .91. The implication of this correlation is not that increase in population results in the increase in per capita income, but rather that with the economic conditions during the period under consideration, the economy was in a stage of increasing return. Increasing population resulted in the increase in per capita output and per capita income.

At present, the economic conditions still seem to be in favour of population growth. During the period of the First National Economic Development Plan (1961-1966) gross national product rose from about $2,786 million in 1960 to approximately $4,347 million and during the same period per capita income rose from $103 to $131.[9] However, as the rate of population growth is much more rapid than the other factors of production, in the future there will be an excess of labor over other resources. The additional output will be proportionately lower than the number of labor-inputs, i.e., the additional population. This condition is referred to as the stage of diminishing returns.

Investment

Higher rate of population growth implies a need for higher level of investment, even to maintain the existing level of per capita output. Assuming that capital-output ratio of Thailand is 4:1,[10] in order to maintain the existing level of per capita income there is a need for additional investment of about 4% of the national income. With the population growth rate of 3%, an extra 12% of national income must be

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9. National Institute of Development Administration, Economic Development of Thailand Under the First National Economic Development Plan 1961-1966 and Important Features of the Second National Economic and Social Development Plan 1967-1971, Bangkok: Publishing House of the Cooperative Wholesale Society of Thailand, 1967, p. 67.

10. Many economists, including Rostow, tend to give the ratio of 3:1 as an example for consideration. However, to make it more safer for economic planning, the ratio of 4:1 seems to be better. See Joseph J. Spengler, "Population and Economic Growth" in Ronald Freedman, ed., Population: The Vital Revolution, New York: Doubleday & Co., Inc., 1964, p. 67. See also W. W. Rostow, The Stages of Economic Growth: A Non-Communist Manifesto, Forge Village, Massachusetts: The Murray Printing Company, 1962, p. 141.

invested to maintain the existing level of per capita income. As one of the targets of the First National Economic Development Plan (1961-1966) is the increasing of 3% of per capita income,[11] an extra investment of 24% of the national income is needed. Such a high level of investment as this seems to be beyond the capability of Thailand, and actually during the period under the First National Economic Development Plan, capital formation on average was 20% of the gross national product,[12] which was approximately 15% of the national income. This was 3% above the amount of investment necessary to maintain the existing level of per capita income. The result was the small percentage of increase in per capita income of about 2.3 percent per annum.

According to the government policy, the greater portion of finance for the over-all development was derived from loans rather than taxation. In 1966 the total government expenditures was $720 millions; the total debt outstanding was about $865 millions (internal debt = $613 millions; external debt = $252 millions); and the total foreign assistance was about $29 millions.[13] In brief, these facts indicate that there was a small internal investment, which, according to the estimation of the National Economic Development Board, was probably not more than 6% to 7% (per year) of the national income. The reason for the inadequacy of the internal investment is that population growth absorbs resources that might otherwise be saved and invested in production. Provision must be made for all necessities for the increased population, for instance,

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11. National Economic Development Board, National Economic Development Plan (1961-1966), Bangkok: Kan Sassana Publishing House, 1960, p. 7.

12. National Institute of Development Administration, op. cit., pp. 67.

13. Ibid., pp. 69-72.

expenditure for rearing, education, training, and public welfare. As for the external source or finance, it has to be accepted that both foreign loans and assistance are uncertain and the amount is limited. Furthermore, Thailand must compete with other developing countries in obtaining them. In spite of these facts indicating the difficulty in the increase in investment even at the level of 24% of the national income, the Second National Economic and Social Development (1967-1971) expects an increase of 5% per annum of per capita income[14] which means that an extra 32% of national income must be invested. This goal seems to be very difficult to achieve. From the above discussion it will be seen that rapid increase in population tends to reduce the rate of savings, making capital formation difficult. Thus, this factor should be considered to be an important barrier to economic development.

Unfavorable Age-Composition

It had been stated previously that a country with a large proportion of economically active population, *ceteris paribus*, is economically better off than a country with a large proportion of dependent population. A high population growth rate results in the reduction of the proportion of the economically active population, which means an increase in the proportion of the dependent population. A population with a high growth rate normally has an unfavorable age-composition for economic development, i.e., a relatively large proportion of dependent population, or a high dependency ratio. The young is the major component of the dependency ratio of a country with a high growth rate. Thailand in 1960, for instance,

14. *Ibid.*, p. 78

had a total dependency ratio of 124, (118 youth dependency ratio and 6 aged dependency ratio).

According to Kamerschen, a dependency ratio over 100 indicates over-population and other population problems.[15] Now, as the dependency ratio of Thailand in 1960 was 124, is she over-populated? The previous analysis of per capita income indicated that Thailand was not yet over-populated, as her per capita income was increasing in accordance with population increase. This shows an incompatibility between the two indices - dependency ratio and per capita income. And if this problem occurs, Kamerschen's suggestion is that income growth rate and population growth rate have to be brought under consideration for the best judgment. The judgment already made was that up to 1960 the economy of Thailand was still in the stage of increasing return. Increasing population resulted in the increase in per capita output and per capita income, The problem of over-population had not yet occured. However, if the current rate of population growth would continue, over-population would undoubtedly occur in the future.[16] In this respect, a high dependency ratio can still serve as a warning signal for problems which may occur in future.

Even though Thailand in 1960 was not yet over-populated, the high dependency ratio reflects other problems. As indicated earlier, the major component of dependency of Thailand was the young whose number was twenty times larger than that of the aged. This implies that a large proportion of resources must be spent to support the young, dependents population. Otherwise, if the number of the young were smaller a part

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15. See Chapter II under the sub-heading "The Theory of Optimum size of Population".

16. See p. 106.

of these resources could be used for economic development. If the present rate of population growth continues, the future population of Thailand would have an age-composition which will be even more unfavorable to economic production than it is at present. According to Gille and Chalothorn the dependency ratio of Thai population in 1970 would be 138 (YDR = 131; ADR = 7) and in 1980 it would be 145 (YDR = 138; ADR = 7). This implies an aggravation of population problems derived from unfavorable age-composition, if the population growth rate continues.

The Consequence of Population Growth on Social Conditions

Population growth normally increases the social responsibilities in a society. Besides economic burdens which have already been mentioned, social burdens, - health, education, welfare, etc., - must also receive attention. Population growth enlarges the magnitude of the problems and makes them more complicated, thus tends to make solution more difficult.

Health Problems

It is quite obvious that health problems such as the inadequacy of hospitals, doctors, nurses, medical supplies and health facilities, which have been serious when the population was smaller have now become more intense. Although the number of doctors per thousand inhabitants has increased from 1 per 13,600 in 1947 to 1 per 7,100 in 1956,[17] the majority of the increased population (87%) live in rural areas while the majority of doctors live in the cities, particularly in Bangkok. In 1957 the

17. The International Bank for Reconstruction and Development, A Public Development Program for Thailand, Baltimore: The John Hopkins Press, 1963, p. 154.

number of doctors in Bangkok was 1 per 1,100 population compared with 1 per 30,000 in the rest of the country. According to the population projection made by Gille and Chalothorn, the rural population will rise from about 24.7 millions in 1960 to 33.5 millions in 1970, and 46.1 millions in 1980.[18] Assuming that the increase in number of doctors is proportionately smaller than the increase in the number of the total population and that the majority of the doctors will still concentrate in the cities (especially in Bangkok), the proportion of doctors and the other health personnel in most parts of the country will probably worsen.

What have been said concerning the problem of doctor shortage is also true for other health problems, for instance, the shortage of nurses. In 1960 there were about 5,000 practicing nurses in the country, and two-thirds were in the Greater Bangkok area. It was estimated that 25,000 are needed. Considering the shortage of dentists, pharmacists, and midwives, the situation is much the same. The supply of hospital beds in Thailand, averaging 0.5 beds per 1,000 population, ranging from 1.9 in Bangkok to 0.1 in the worst supplied area, is low, and over half of all beds are in the metropolitan area.[19]

Although various measures were carried out by the government to improve health conditions, the high population growth rate tends to increase the magnitude of the problem and thus make it more difficult to tackle. Unless the present population growth rate will be reduced by appropriate

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18. Halvor Gille and Thip Chalothorn, "The Demographic Outlook of Thailand and Some Implications", in National Seminar on the Population of Thailand, 1963, p. 137.

19. The International Bank for Reconstruction and Development, op. cit., pp. 154-155.

measures, health improvement will continue to be one of the major problems in Thailand.

Education

According to the Manpower Planning Office in the National Economic Development Board, Thailand needs to increase her educated manpower. For the period 1960 to 1986, this office estimated manpower needs implied by different levels of education. These estimates are shown in Table 29.

Table 29. Manpower needs at different levels of education, for Thailand, 1960-1986

Level of Education	No. of manpower needed
Bachelor degree and above	314,991
Technical college	781,310
Senior high: general & vocational	7,332,033
Junior high	8,220,985
Elementary education (grade 7)	21,691,443

Source: Kaw Sawasdi Panish, The Problems of Educating and Training the Future Manpower, a paper presented to the Second National Seminar on the Population of Thailand, 1966, (Mimeographed), p. 2.

Compare the estimated manpower needs at different levels of education during the period of 26 years from 1960 to 1986, with the actual number produced by the educational system. In the year 1963, for instance, there is a wide discrepancy at every level of education, as seen in Table 30.

Table 30. Manpower needed per year and the actual number produced by the educational system, Thailand, 1963.

Level of Education	No. Needed Per Year	Actual No. Produced in 1963
Bachelor degree and above	12,115	4,780
Technical College	30,050	5,438
Senior high: General & Vocational	282,001	16,094
Junior high	316,191	75,365
Elementary education (grade 7)	834,286	686,879

Source: Kaw Sawasdi Panish, The Problems of Educating and Training the Future Manpower, a paper presented to the Second National Seminar on the Population of Thailand, 1966, (Mimeographed), pp. 3-4.

The reason for the failure of the educational system to produce enough manpower at different levels of education was the lack of resources to carry out the educational plan. The lack of buildings, class rooms, instructers, and facilities bars thousands of high school graduates each year from entering the universities. The same reason also explains the inability of the government to execute her educational plan pertaining to elementary education. The plan to expand compulsory education from 4 years (grade 1 to 4) to 7 years (grade 1 to 7) could be carried out in a few provinces only. Amnuey Virawan[20] and many others believe that there is no possibility for this new plan to be accomplished even within 20 years.

20. Ammuey Virawan, "Does Thailand Need a Population Policy?" in National Seminar on the Population of Thailand, 1963, Bangkok: Office of the National Research Council, 1963, pp. 350-351.

The rapid population growth rate results in the increase of "young", school age population and thus educational problems in future seems to be magnified.

Other Social Problems

Besides the problems of health and education, population growth tends to increase many other problems. The additional population, for example, requires more houses (particularly in urban areas), roads, transportation, communication facilities, drinking water, etc., which seem to be beyond the capability of the society to provide all such things simultaneously at the level where they are needed. Thus, from an administrative point of view, there should be a priority for those problems which require attention before the others. At the same time reduction of population growth seems necessary.

Other Consequences of Population Growth

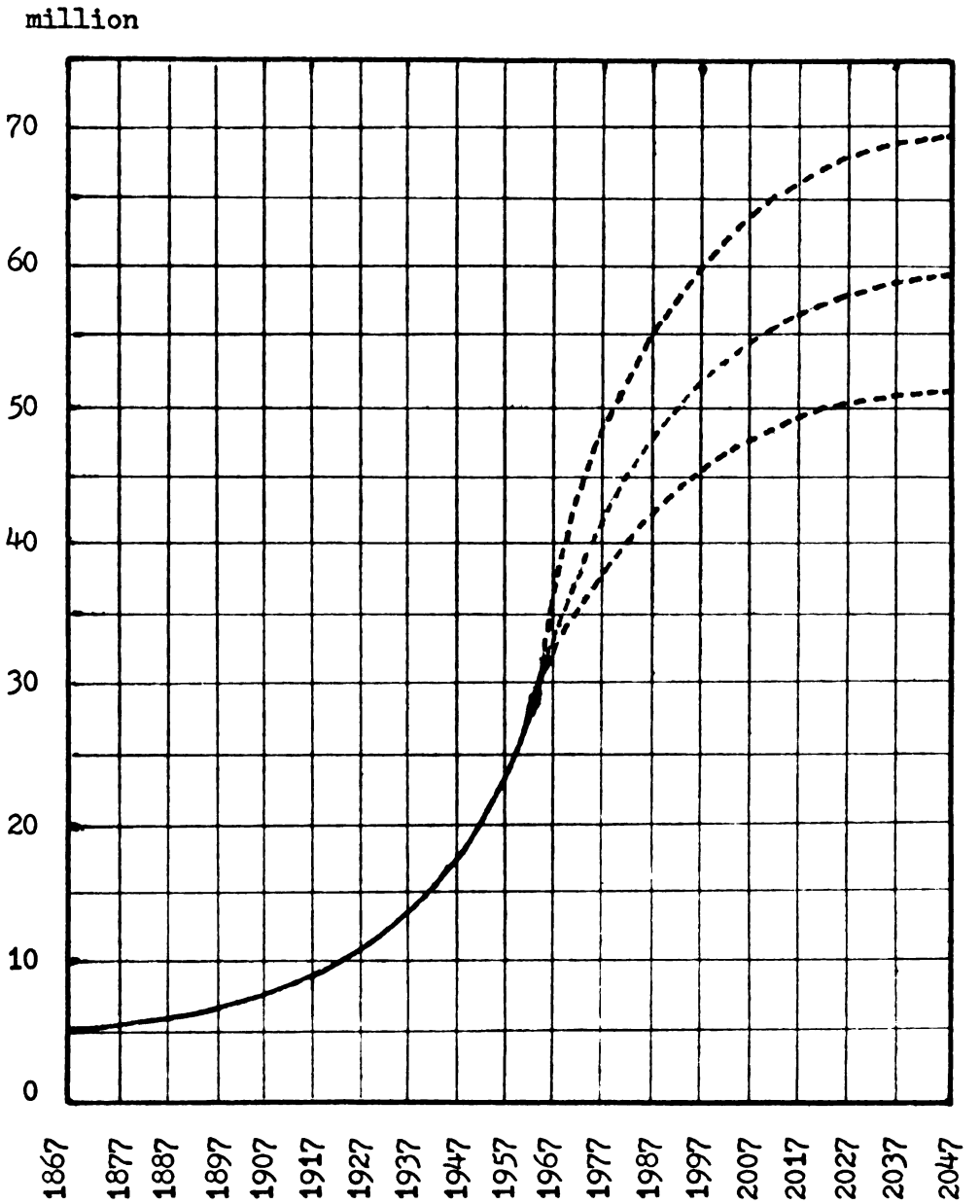
To avoid being one-sided it is necessary to shift the discussion about the consequences of population growth in Thailand from a pessimistic to an optimistic point of view and to evaluate existing and future conditions.

Population Growth in Thailand May Comply with the Theory of Logistic Curve of Population Growth

According to the theory of the logistic curve of population growth, population growth in Thailand will reach a point in the future where growth rate will decline and the number will not exceed a certain maximum. Estimation made by the Committee of Political Science and Public Administration, in the National Research Council, indicates that population growth in Thailand will naturally reach the maximum point, in 2047 or in

about 80 years. At the maximum point the number of population is estimated to be: 70 million (the highest); 59 million (the moderate); or 52 million (the lowest).

Figure 14. Trend of population growth in Thailand, 1960-2047.



Source: The Committee of Political Science and Public Administration, in the National Research Council, Report on the Problem of Population Growth in Thailand.

However, there are two points to be considered. First, we really do not know for sure whether the maximum number people will be close to that portrayed in Figure 14. The curve may go higher than it appears in Figure 14 before it reaches its peak. Second, there is no good reason why the Thai people have to wait for the condition to solve itself when there is available knowledge and techniques to solve the problem at present.

Would Population Growth Increase Social Power and Military Strength of Thai Society?

According to Coste, population size and density create social power which leads to the progress of a nation.[21] This does not seem to be true for Thailand or for many other nations. Inadequate resources to take care of the increased population will result in small improvement in the quality of the population. Increase of contact between people of low quality seems not to increase social power. Besides, if size and density of population would continually increased at the same rate while the increase in resources is slow, then there will likely more problems than progress. As for the proposition that military strength is associated with an increased size of population, this also is not true for Thailand. It had been stated previously that the military strength of a country at present time does not depend solely on the number of population, but rather on the quality of the population, arms, and many other conditions. Now, if the present rate of population growth continues, there will be less hope for the improvement of the quality of the future population and socio-economic conditions. This will be much the same

21. See Chapter II, p. 18.

for the improvement of arms. Thus, even though the size of the population will become larger, there will be no increase in military strength.

Is Population Growth a Source of Abundance?

According to Everett, a larger size of population enhances the division of labor in a society, which ultimately leads to the expansion of manufacturing and trade.[22] This is true for most of the countries where manufacturing is dominant. But for Thailand where 82.3 percent of the population is engaged in agriculture and only 3.4 percent and 5.7 percent are in manufacturing and commerce respectively, this is not true. In agriculture, especially where the prevailing method of production is traditional, there is less possibility of division of labor. Thus it makes little difference how large or dense the population is.

Carey held that the law of diminishing return did not affect agriculture since cultivation proceeded from inferior to superior soil.[23] In Thailand cultivation proceeded from superior to inferior soil. Besides, as Thailand is a small country, the land area is limited. Increasing population results in the decreasing area of land per person. Additional labor working on the same size of land will ultimately decrease yield per capita. Beaulieu and Wageman believed in technical progress and capital accumulation which, they thought, will prevent the occurance of the law of diminishing return.[24] In Thailand the technique in agricultural production shows small progress. The majority of the farmers still farm by

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22. Ibid., p. 21.

23. Ibid.,

24. Ibid., p. 22.

traditional methods and there is very little possibility for capital accumulation. Diminishing return to labor will undoubtedly occur, at a certain time, in agriculture where there is increasing labor while there is less technical progress and inadequate application of capital.

The Committee of Political Science and Public Administration in 1963 felt that Thailand was still depopulated, as her density was only 50 persons per square kilometer, and concluded that Thailand needed more population.[25] This opinion seems to underestimate the problem of shortage of land. At present the average size of farm is already small, about 10 acres, and most of the available land for agriculture is already being cultivated. There is only a small and a relatively inferior land left to be brought under cultivation. Increased population will worsen the situation.

The Committee of Political Science and Public Administration also felt that in the process of industrialization, there was a need for more population having knowledge and skills required by the industry. To draw labor from the agricultural sector to the industrial sector would be difficult, as traditional agriculture needs a large number of labor. The Committee also saw that an increase in population means an increase in the number of consumers who will help to consume the economic goods produced by the industrial sector (assuming that Thai commodities will not be able to compete with foreign comodities on the world market), and thus enable the expansion of industry which means that more jobs are available.[26]

The Committee expected that demand for skilled labor by the

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25. Sangad Plengvanij, op. cit., p. 464

26. Ibid.

industrial sector would be met by the increased population. Unfortunately, the majority of the increased population were, and will in near future, be in agriculture. Besides, there was insufficient resources to train the added population in the knowledge and skill required by the industry. Furthermore, in the first stage of economic development, the first priority to receive attention for improvement is agriculture, not industry. Agriculture must be improved up to the level that it can supply enough food for the increased population, the growing urban population, and to help meet the foreign exchange bill for capital development. If this does not occur, serious economic difficulties are likely to result.[27]

The Committee seems to be over-pessimistic in expecting the excess population to buy all goods produced by the industrial sector. It has to be realized that demand for goods includes both the desire and sufficient income to buy the wanted goods. Size of population alone does not create economic demand. Considering all aspects of the problem, it is likely that the majority of the increased population will have wants rather than demand, thus the hope for goods to be absorbed by the increased population is dim. At any rate, the hope for the expansion of industry and for economic development in a country such as Thailand, through the increase of population is likely to be a wrong policy. According to Keynes, in a relatively high-income economy increasing demand derived from population growth tends to stimulate economic activities, i.e., more demand for economic goods stimulates the expansion of industrial plants which inturn creates more job. Increasing employment results in

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27. W. W. Rostow, op. cit., pp. 22-23; see also Millikan Blackmer and Donald L. M. Blackmer, eds., The Emerging Nations: Their Growth and United Policy, Boston: Little, Brown and Company, 1961, p. 51.

an increase in personal income, hence an increase in demand, which again, causes the expansion of industry.[28] Now in the Countries having relatively low-income, including Thailand, deficiency of a supply of capital, not of demand for goods, is the major problem. In the low-income econimy, increase in capital will help economic development; while increase in population (especially at a high growth rate) will rather be an important obstacle to economic growth. What Thailand needs, at present, is not more population, but more capital, knowledge and technology.

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28 Coale and Hoover, op. cit., p. 21.

CHAPTER V

REDUCING THE RATE OF POPULATION GROWTH

> "Modern man cannot escape the laws of population growth. Populations tend to increase faster than the means of subsistence and must be controlled either by the positive checks that increase death rates or by the preventive checks that reduce birth rate. A survey of world history provides ample proof that Malthusian checks have always controlled the growth of human populations. Man can now choose which of the two checks he desires - high death rates or low birth rates."[1]

The discussion in Chapter IV showed that the population problem in Thailand is real. Derived from population growth are various problems, both social and economic. There are many approaches to the solution of these problems. Here is an example. Facing the near starvation problem in Germany in 1947, Dr. Otto F. K. Dibelius, of the German Evangelical Church, Bishop of Berlin and Brandenburg, before a group of more than a hundred clergymen in Cleveland, proposed three solutions: (1) the emigration of 20 to 30 million Germans to other countries so that the remaining Germans would not place pressure on the limited lands; (2) the development of additional industry in order to pay in exports for the imported necessities of life; and (3) to let about 30 million Germans die so that the rest of the German population can survive on the food production of the homeland.[2] As for the first solution, it was accepted

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1. Karl Sax, Standing Room Only: The World's Exploding Population, Boston: Beacon Press,,1963, p. 27.

2. Ibid., p. 28.

by the Bishop himself that no country in the world would allow such an immigration. The success of the second solution would be very difficult, since American producers and others would not be eager to have German competitors back in the field. The third solution is both absurd and immoral. If these three solutions were to be proposed to solve the population problems in Thailand their inapplicability would resemble the German case. Concerning the second solution, there is no need to think about the competitors on the world market yet, for with the existing economic conditions, it is likely that Thailand will not be able to produce anything in the near future to meet the competition on the world market.

In addition to the solutions mentioned by Bishop Dibelius, there are three additional solutions for the population problems in Thailand: (1) the improvement of agricultural production; (2) the control of mortality by permitting the death rate to increase; and (3) the reduction of the birth rate. The first solution is possible and will be discussed in Chapter VI. The second, although similar to the third solution of Bishop Dibelius, is absurd as well as immoral. The third is a feasible possibility and will be discussed in this Chapter. The best solution in all probability, is the application, at the same time, of improving agricultural production and reducing the birth rate.

The Advantages of Reducing the Rate of Population Growth

The preceeding Chapter was an attempt to show the present and future problems, derived from the present rate of population growth. Let us examine here what some of the advantages would be for Thailand if the present population growth rate were reduced.

The United States Operation Mission to Thailand (USOM) prepared charts with explanations showing the effects of population growth on economic and social development in Thailand.[3] Although the projections made by USOM for this analysis are not necessarily precise (as indicated by USOM itself), they are relatively close to the projections made by Gille and Chalothorn. Nevertheless, they can serve our purpose in explaining the advantages which will derive from the reduction of population growth.

The projections made by USOM consist of two long-run rates of growth, from 1910 to 2000. The first is a high projection, assuming that the current estimated rate of population growth of 3.4 percent per year will continue to 2000. This means that there would be 64 million people in 1986 and 103 million in the year 2000. The second is a low projection assuming a 10 percent decline in growth rate during each 5-year period from 1970 to 2000. The rate of 3.4 percent would decline to 1.8 percent per annum or a 53 percent decrease over the 30-year period. If the assumptions would be correct, there would be about 54 million people in 1986 and only about 80 million in 2000. USOM's suggestion was that such a decline could be feasible if a concerted effort were made to provide family planning services throughout the country within the immediate future.

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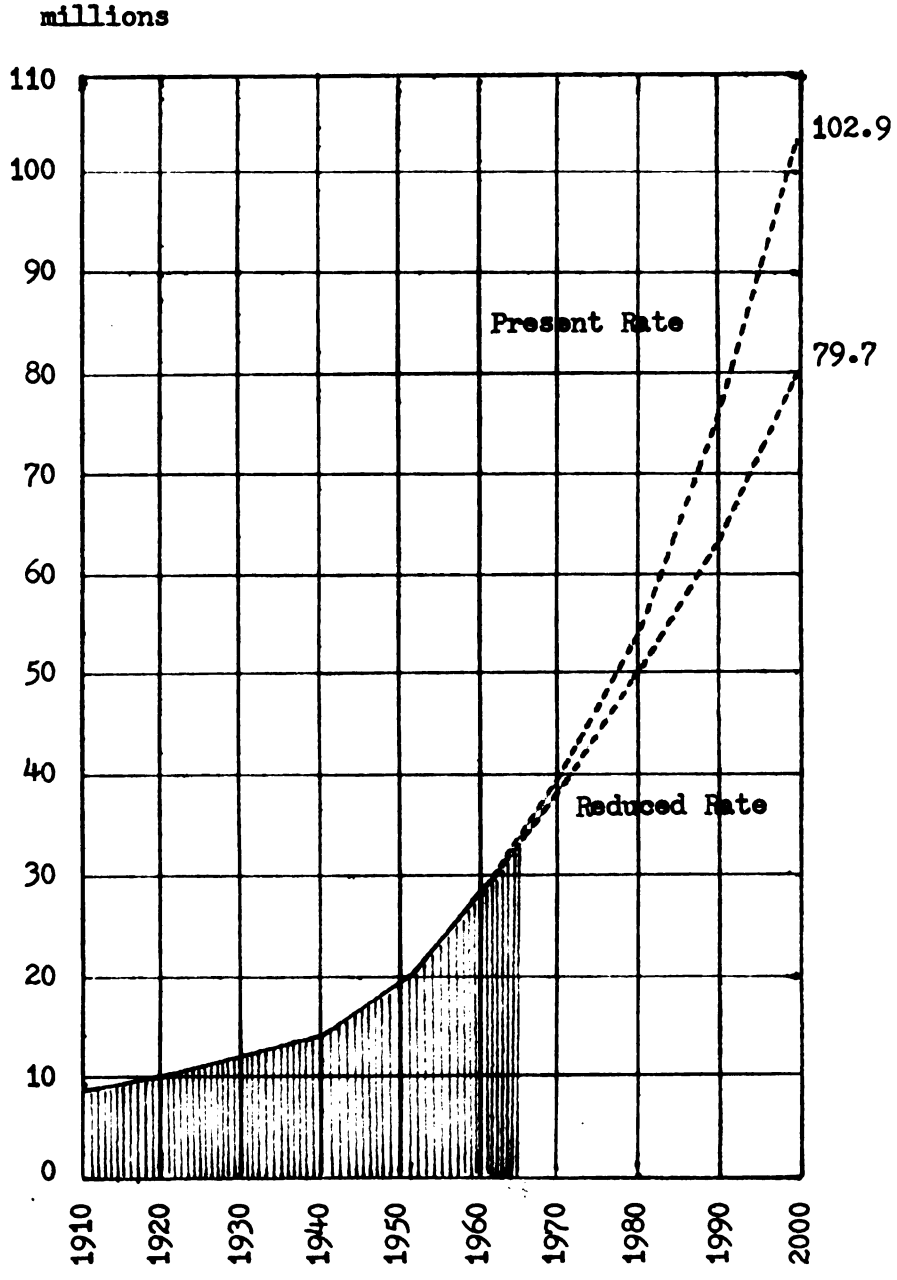
3. United States Operation Mission to Thailand, Effects of Population Growth on Economic and Social Development in Thailand, Bangkok: Thai-American Audiovisual Service, 1967.

Figure 15. Population growth in Thailand, 1910-2000



Source: USOM, Thailand.

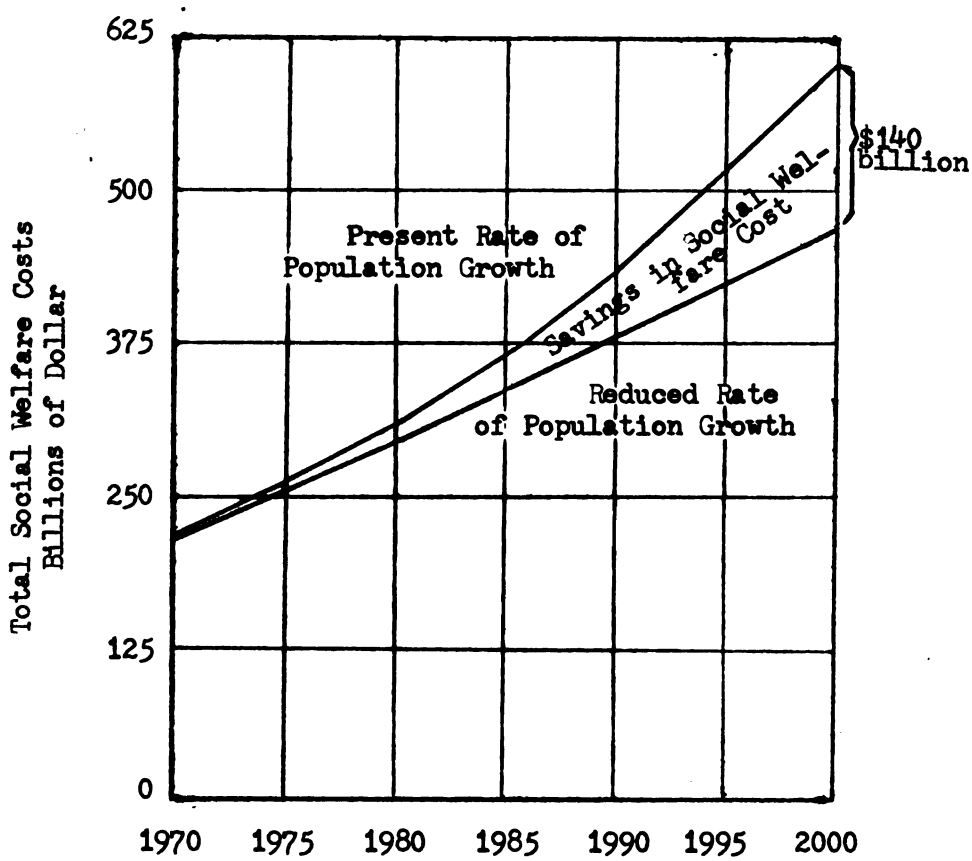
The Effect of Alternative Population Growth Rates Upon Social Welfare Costs

Social welfare costs, expenditures on education, health, and community facilities, vary with the size of population. A lower population growth rate will free funds for the improvement of social welfare and for investment in production.

In accordance with the Second National Economic and Social Development Plan (1967-1971), estimated expenditures for various activities were made by the National Economic Development Board (NEDB). As for social welfare costs, the total expenditures for 1971 were estimated to be about $232.75 million. The estimated high population for the year 1971 was about 39 million and the 1971 per capita expenditure for social welfare was estimated to be around $6.

To obtain estimates of total social welfare costs, the 1971 per capita cost was multiplied by the size of the population for each year from 1970 to 2000. In this way USOM was able to show the difference between the total costs under alternative population projections. The reduced rate of population growth (according to second projection) would save the government an estimated $140 million in the year 2000 in social welfare costs. See Figure 16.

Figure 16. The effect of alternative population growth rates upon social welfare costs for Thailand, 1970-2000



Source: USOM, Thailand.

The Effect of Population Growth on Educational Enrollments

If population growth continues at the present rate, four times as many young people will seek education in the year 2000 as were enrolled in 1960. In 1960 about 4.3 million persons were enrolled at all levels. With the continuance of present rate of population growth, 6.2; 8.8; 13.0 and 17.0 million persons are expected to seek education in the years 1970, 1980, 1990 and 2000 respectively. On the other hand, with the reduced rate of population growth the number of persons expected

to seek education would be smaller i.e., 6.0; 7.6; 11.0; and 13.6 million in the years 1970, 1980, 1990, and 2000 respectively. Needless to say, it is obvious that the cost of education would be greatly reduced if the rate of population growth would decline.

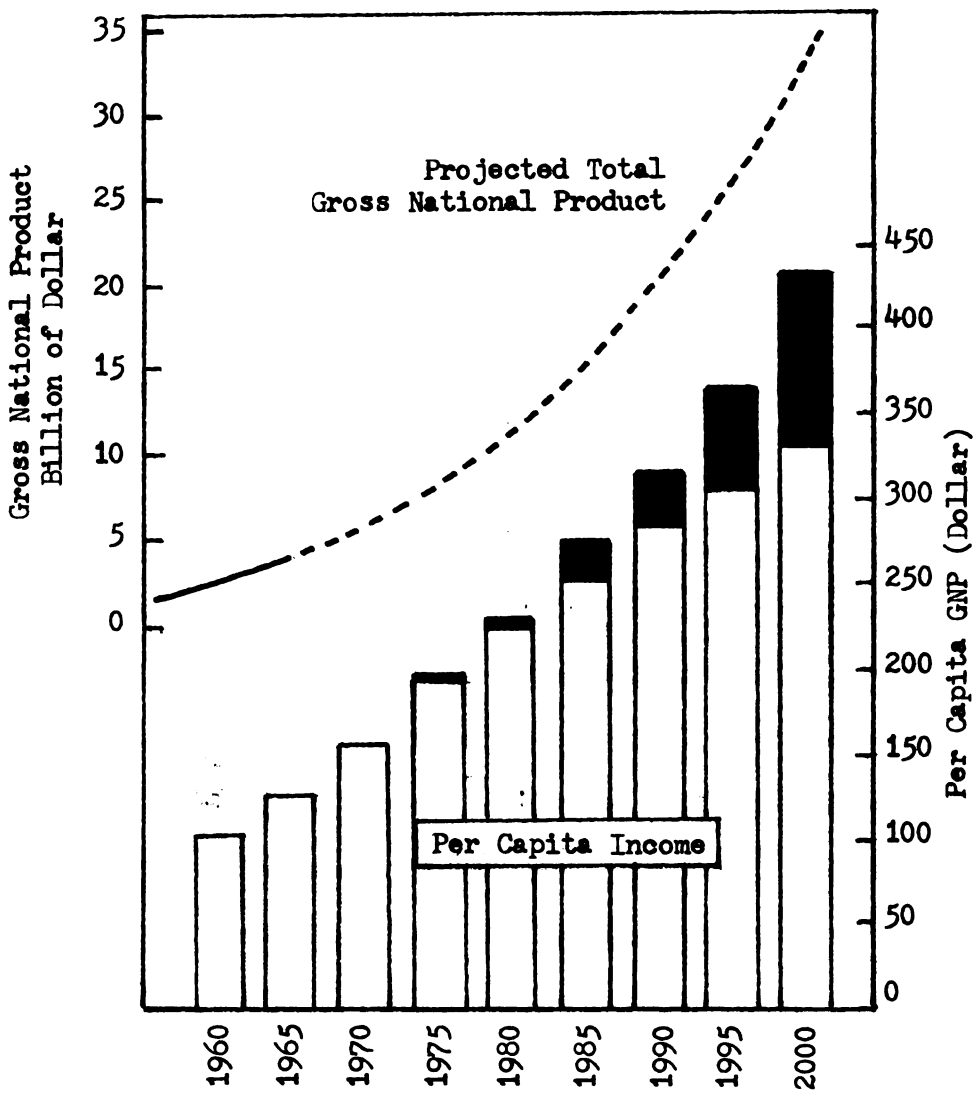
The Effect of Population Growth on the Labor Force

If the high population projection is realized, the number of people seeking jobs in the year 2000 would be almost three times larger than that of the year 1960. The number of persons in the labor force in 1960 was about 13.8 million. If the present rate of population growth continues there would be about 44.2 million persons seeking jobs in the year 2000. Should the rate of population growth conform to the level prescribed for the low projection, the number of people seeking jobs in the year 2000 would be about 34.3 million. In other words, the high population estimate will require the creation of about 30 million new jobs during the next 33 years. The low projection will require about 20 million new jobs. The reduction of about 10 million obviously reduces markedly the responsibilities on the economy.

Per Capita GNP and Population Growth

Based on the existing and estimated future social and economic conditions in the period 1968 to 2000, it was estimated by USOM that the GNP of Thailand will rise slowly from about $2.8 billion in 1960 to about $35.5 billion in 2000. Under the high population projection, the per capita GNP would rise from about $100 in 1960 to about $335 in the year 2000. At the reduced population growth rate, however, the per capita GNP in the year 2000 would be as high as $435, or $100 higher. See Figure 17.

Figure 17. Per capita GNP and population growth, Thailand, 1960-2000



Note. The increase in per capita GNP due to a reduced population growth rate is shown in black.

Source: USOM, Thailand.

Family Planning

The family, the most important social system in Thai as well as in many other societies, is the strategic point in the formation of programs for reducing the population growth rate.[4] Compare with European and American family size, the Thai family is relatively large, averaging about 6.[5] Benefits derived from the reduction of family size are not confined to the society as a whole, but the family itself benefits as well. As we have shown previously, while family income is higher in the Northeast than in the East, per capita income is larger in the latter due to smaller average size of the family. While this exemplifies economic benefit, there are many other advantages, both economic and social which derive from smaller size of family.

Factors Affecting Fertility

It is now necessary to consider the factors contributing to the size of family in Thai society. In discussing fertility, four major factors are usually involved, namely, biological, the economic and the social and cultural. The present discussion will be confined to the economic and the social and cultural, and will follow insofar as possible the "intermediate variables" outlined by Kingsley Davis and Judith Blake.

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4. Procreation is one of the four important functions of the family. See Charles P. Loomis and J. Allan Beegle, Rural Sociology: The Strategy of Change, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960, pp. 59-60.

5. In demography, the term "family size," refers to the total number of children born to a married couple over the whole of the wife's reproductive span. See Dennis H. Wrong, Population and Society, New York; Random House, 1962, p. 50. But here for convenience, this term is referred to the total number of the members of a family, i.e., parents and their children.

Economic Aspects. If feeling of economic insecurity contributes to the decline of birth rates,[6] then a feeling of economic security may contribute to a stationary or an increase in the birth rate. In general, the standard of living of agrarian people is relatively lower than others, except perhaps laborers. It is often characteristic that those having low level of living and income will not feel deprived. This seems to be true in Thailand. Thailand is composed of small farmers who own their own land. Although their annual family-income is only $250, they feel secure in their traditional way of life. It is not considered an economic burden for the average farm family to rear 4 or 5 children. In the survey on attitudes towards fertility in 1962 Phasuknirant asked the question whether there was any difficulty in raising their children. One hundred eighty farmers or 58.8% of the total respondents gave the answer that there was no difficulty at all.[7] At the age of eleven and sometimes even earlier Thai children will become family laborers and the cost of rearing is offset by their work.

Socio-Cultural Aspects. Kingsley Davis and Judith Blake have listed 11 socio-cultural variables affecting fertility. These variable are grouped under three main headings according to the stages of the reproductive process that they influence, either positively or negatively:

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6. Clyde V. Kiser and P. K. Whelpton, "The Interrelation of Fertility, Fertility Planning, and Feeling of Economic Security," in P. K. Whelpton and Clyde V. Kiser, eds., Social and Psychological Factors Affecting Fertility, Vol. III, New York: The Milbank Memorial Fund, p. 467.

7. Sak Phasuknirant, "Survey on Attitudes Towards Fertility Among Farmers and Government Workers," in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, p. 295.

factors affecting exposure to intercourse (intercourse variables), factors affecting exposure to conception (conception variables), and factors affecting gestation and successful parturition (gestation variables).[8] The following discussion considers the socio-cultural variables which affect fertility of the population of Thailand positively.

1. The intercourse variables: (a) the age of entry into sexual unions. At present the age of entry into sexual unions is about 22 for males and about 17 for females. The early marriage of females is a factor contributing to the high fertility rate. (b) permanent celibacy. Buddhist monks in 1960 numbered about 150,000 or about 1.14% of the all males. However, as the monks can resign from priesthood any time they desire, this figure is not precise in indicating the number of permanent celibate males. Other than the Buddhist monk, there is no other evidence of permanent celibacy. From the 1960 census data it was found that among males in the age-group 70 and over, only 1.7 percent were single. The same proportion of females in this age group were also single. Thus, permanent celibacy has a positive rather than negative fertility value in Thailand. (c) voluntary abstinance. There is no clear evidence regarding this variable. Voluntary abstinance from intercourse within unions during pregnancy and a few weeks after childbirth may be practiced by many couples. But there is no standard norms or practices. It may be said that voluntary abstinance is relatively small.

2. The conception variables: (a) the use of contraception. Although there is no precise emperical data, it may not be wrong to state

8. Kingsley Davis and Judith Blake, "Social Structure and Fertility: An Analytic Framework", in Seymour Martin Lipset and Neil J. Smelser, eds., Sociology: The Progress of a Decade, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963, pp. 356-377.

that there are relatively few people who know about the use of modern means of contraception. (b) infecundity affected by voluntary causes: From the aforementional survey made by Phasuknirant it was found that most of the farmers thought that birth was due to nature and fate. Few farmers knew that doctor could help them with birth control, and the method practiced by the doctors, which farmers heard about was sterilization. Yet, the farmers thought that birth control was harmful, in one way or another, or it might reduce their strength so that they would not be able to do their work which required strength.[9]

3. The gestation variables: (a) foetal mortality from involuntary causes. Traditionally the elder relatives and the husband "keep good eyes" on the pregnant woman whose movement should be refined and whose work must not be hard work. Besides, with the improvement in health programs, which were extended to the population even in the remote areas, the foetal mortality rate from involuntary causes has been declining. (b) foetal mortality from voluntary causes. There is no tradition of infanticide in Thailand. Abortion, although it may be practiced by a few women who give birth out of wedlock, is strongly against the social norm, the origin of which is from Buddhism, the religion of the great majority of the Thai.

Social System and Fertility

As Blumer[10] and Davis[11] suggest, it is now necessary to view the

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9. Sak Phasuknirant, op. cit., pp. 297-298.

10. Herbert Blumer, "Sociological Analysis and the Variable," in American Sociological Review, Vol. 21, 1956, (December), p. 685.

11. Kingsley Davis, "The Sociology of Demographic Behavior," in Robert K. Merton et al., eds., Sociology Today: Problem and Prospects, New York: Basic Books, inc., 1959, p. 316.

family as a social unit within the social structure, and to examine how attitudes and behavior about reproduction are influenced by other social units, institutions, beliefs, norms, etc.

Viewing Thailand as a social system, it can be roughly divided into three major units: Greater Bangkok; provinces and districts; and villages. The Greater Bangkok is the seat of the National government. It is the residence of the old elite, the new elite (high rank government officials and the big business men), and persons of higher education. Greater Bangkok is thus the center of economic, cultural, social, and educatuonal activities. The normal pattern of the diffusion of culture is that it flows from Greater Bangkok to the provinces, to districts, and then to the villages. In general, the population within Greater Bangkok are more "modernized" than the rest of the population. But as far as knowledge and attitudes about birth control is concerned, it seems that although in Greater Bangkok there may be more people whose attitudes about birth control are positive, their knowledge about birth control is limited and there probably is less diffusion from those who know about the matter to others. The reason is that among the Thai it is immoral to talk about sex, no matter what aspect it may concern. The spread of knowledge about birth control has been barred by this moral ethic.

Before 1963 there was only one organization whose work was concerned with family planning - the Family Planning Association of Thailand, - founded in 1955. It is a small association, operating on a voluntary basis. In 1961 there were only 1808 members throughout the whole country and most of them were government officials of lower ranks. As it works on a small scale its effect in spreading knowledge about

family planning and its services are small indeed.

As the great majority of the population of Thailand are rural people, it is better to view Thailand as a Nation of villagers. The village should be looked upon as a particular social system. Within the villages are these major social units: the family, the temple, the school, and the smallest unit of the government - the head of village and his assistant.

The majority of the families are farm families of an extended type, having about 10 acres of land. Family labor is used extensively. Children of about eight years old start to help the family by taking care of the buffaloes used by the family as draft animals and also by taking care of the smaller children. The ends or objectives of the family as a sub-system are usually confined to subsistence, i.e., to be able to live happily together without hunger is good enough. Very few families consider improvement of their standard of living as an important objective. A prevailing family value is that the aged would feel more secure when surrounded by blood relatives. Besides, to be a grandfather or grandmother with many grandsons and granddaughters makes one feel more important in Thai Society.

The level of education of the farmers is relatively low and their image about the world is rather narrow, because they seldom have chance to contact with people outside their own village or district. The village school gives education up to fourth grade only. Normally, there is no meeting between the teachers and the parents. The relationship between the head of the village and the villagers is rather formal as the head of the village is vested with authority to call village meetings and to ask for labor and help from the villagers for some work considered

to be public.

The Buddhist temple is the religious institution exerting influence over all other social units. It is the center around which the life of all villagers revolve. It is the teaching from this temple that shapes the daily life of the villagers, - it guides the villagers in their behavior in almost every respect. Among the Buddhist's teachings, merit-making is the one which is deeply impressed on the villagers. Merit-making, as they believe, helps to prove one's karma, so that one will be happier in the next life. To become a monk is believed to be the highest form of merit-making. Most Buddhists do not think that birth control is a good thing. There are three main reasons behind their thought. First, birth control violates the Buddhist's precept of "kill not". This is due to the fact that the common method of birth control known is abortion: to these persons birth control means abortion which means "kill" and hence it is a sin. Second, birth control violates the rule of karma. According to the rule of karma one will be reborn and gather the result of his deeds in the past life. Birth control prohibits the rebirth of a soul and thus it violates this rule of life. Third, a sterile male cannot enter priesthood. In case sterilization is applied to a male as a means of birth control, its result will be that he loses his chance to engage in the highest form of merit-making, that of becoming a Buddhist monk.

The economic structure of the village community is unbalanced in that activities are concentrated on production and consumption, and very little the activity of distribution. In other words, there are many families who produce and consume their own products but few who engage in marketing. The surplus is sold to the outside-merchants.

In a village there may be one small shop, and this is the only trading unit the villagers have. With this picture in mind one will see that, with the exception of the family as a sub-unit, there is little division of labor in the village. The cohesiveness of the social units is of "organic solidarity" type, i.e., unity based on the similarity of beliefs and sentiments.[12] Socialization of the children is the function of the family and the school, while socialization of the adults is the function of the temple. Social control is in the hands of the village head, the temple, and sometimes it is exercised by the council of elders. Compared with American villages, there is much less social participation among the Thai villages because there are few social organization outside the family. Mutual support among the villagers is rather strong, but it is a matter of individual relationship rather than group relationship.

Considering the overall social structure and values, it can be concluded that the social system of Thailand is favorable to high fertility. There is very little diffusion of birth control from Greater Bangkok, the cultural center, to the rural villages. The average farm family in Thailand has little education and seldom is in contact with the outside world; it is ignorant of family planning; it looks upon children as family labor; it looks forward to old age surrounded by younger blood relatives; it holds religious beliefs which are contrary to birth control. These are the reason why the Thai family size is large and why the rate of population growth of Thailand is relatively high.

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12. Emile Durkheim, The Division of Labor in Society, (translated by George Simpson) New York: The Free Press of Glencoe, 1964, Chapter II, pp. 70-110.

Government Attitude and Action

In Thailand, a country whose administrative pattern is highly centralized, it is hard to conceive of the success of any program without support from the national government. In Thailand, serious thought about population control began in 1963 when the first National Population Seminar was held. Before that the attitude of the government about this matter was passive. The government had considered two reports, one from the National Research Council and another from the National Economic Development Board. The former took the position that there was no problem of population pressure in Thailand, that an increase in population would be advantageous, and that birth control would lead to the demoralization of the public. The latter report took the position that the problem of population pressure in Thailand was probable, that rapid population growth rate would result in disadvantages to both social and economic progress of the country, that research on population growth should be done by every governmental unit concerned, and that propagation of birth control may be done but that the practice of birth control should be left to individual decision. As a consequence the government decided in 1961 that birth control was an individual concern and that propagation of birth control may be done but must not be too public.[13]

However, after the first National Population Seminar was held in 1963 the government attitude toward the problem changed. In response to the agreement of the Seminar that a family planning pilot project should be initiated to discover the response of a sample of the

13. Sangad Plengvanij, "Reports on Family Planning in Japan and China" in National Seminar on the Population of Thailand, 1963, Bangkok: National Research Council, 1963, pp. 460-477.

population to family planning services, the government approved the idea of asking for aid for launching an exploratory demonstration project supported by the Population Council. Aid received from the Population Council was a grant of funds for a year's operation, and two technical advisers - a social scientist and a physician experienced in family planning work.

The family planning project is called "The Family Health Research Project" because it is hoped that eventually this activity will be integrated into the general health services, especially as far as maternal and child health is concerned. Besides, it is felt that the name will provide some security against intervention that might jeopardize the project. The project had both research and demonstration objectives and it was thus placed under the joint sponsorship of the National Research Council and the Ministry of Public Health.

An advisory committee composed of twelve high-ranking members of government and the two Population Council advisers (Amos H. Hawley and J. Y. Peng) was set up. This committee established a joint project, "The Family Health Research Project," involving the National Research Council, the Health Department of the Ministry of Public Health, and the Population Council. In 1964 a field survey was conducted as a first step in the project, the work of which will be discussed later.

In discussing the family planning project, there are four points left to be mentioned. First, up to the present time the government attitude about the propagation of birth control was still the same; i.e., propagation of birth control may be done but may not be too public, and that the married couple should know their own situation and make their own judgment on how much children they should have. This shows that the

government itself realized the problem but did not want to be fully involved in the family planning program. The thing that bothers the government was the question of morality. As stated before, discussion about sex is felt to be immoral; the government did not want to be viewed as immoral, so it did not want to get involved. The government was also worried about the morality of the youths which might be affected by the propagation about birth control. Perhaps the best argument on this matter is the statement made by Mr. M. C. Changla, Indian Ambassador to the United States in an address to the National Conference on "A New Look at the Population Crisis," Dallas, May, 1960, asking for American aid to produce cheap contraceptives.[14] Said Mr. Changla:

> "I must frankly confess that I am very impatient of the arguments which are advanced against birth control and family planning on the grounds of morality and I hope you will forgive me if I speak frankly and bluntly. What is this morality which condemns millions of children to poverty and destitution? Is it moral that children should be born into this abject condition or is it more moral that children should not be born at all?"

It is rather paradoxical to speak about propagation that is not public, because by its nature propagation concerns the public. The government policy of "propagation, but not too public" will negate full support of the family planning project, even from the doctors themselves, because most people will think that the government does not really like this project. It may also lead to misunderstanding about the purpose of family planning. It will be difficult for those who need birth control information to know from whom they should seek suggestion and help. Also there

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14. A. Nevett, S. J., Population: Explosion or Control?, London: Geofferey Chapman, 1964, pp. 29-30.

may be malpractice because the information is not sufficiently clear. The government should in the opinion of the writer, explicitly accept family planning as its policy. Allocation of budget for this purpose should be made; and full cooperation from every governmental agency concerned should be secured.

Second, under the present circumstances, it is proper that the family planning project should be called "The Family Health Research Project". Psychologically, its advantage is obvious. More cooperation and help from individuals and organizations concerned is likely to be secured by the project because its name refers to health rather than birth control. However, in the long run, problems of cooperation and coordination may occur when some administrative units and some individuals or organization who cooperate with this activity, begin to realize that the project is concerned with medical field only and is not directly concerned with their intellectual field and occupation. (Many government agencies may think that this is none of their business; it is the work of the Ministry of Public Health, not theirs.) This concern may, to some persons, seem trivial, but there is a possibility that the problem might occur and if it did, its effect could be very damaging. During the seminar on Human Fertility and Population Problems held under the auspices of the American Academy of Arts and Sciences in Brookline, Massachusetts, May 3 through 5, 1963, Dr. Frederick L. Hisaw, chairman of the third Session (Field Studies on Fertility of Human Populations), in his introductory remark, spoke as follows about the solution of the population problem: "The question that is before us, it seems to me, is that of finding the most promising possibility of a solution. This seems to rest on concrete efforts of three groups of intellectual disciplines: the biological

sciences, medicine and the social sciences."[15] In the fourth session on the Economic Effects of Fertility Control in Underdeveloped Areas, Dr. Ansley J. Coale, Professor of Economics, who was the speaker, began his speech: "I am neither a sociologist, nor a biologist, and I am not a physician .....That's why I chose to say something on the economics of population....., it is a most serious aspect of population today."[16] In fact Dr. Coale did not mean to be serious about what he said. Nevertheless, his speech shows a pride in one's intellectual field. For this reason, it may be a good idea that after the project has been carried out for a period of time so that the purpose and practice of birth control is correctly known by more people, that the name of the project should be changed to "The Family Planning Project." Since this proposed name is rather neutral, there will be no problem as discussed above, and there may be more cooperation and coordination from the individuals and organizations directly concerned.

Third, administratively, it is probably wise that the project was put under the joint responsibility of the National Research Council whose role is research work, and the Ministry of Public Health whose role is demonstration and rendering services. This structure would seem to foster the integration of research and action program into one administrative unit. According to Freymann and Lionberger, the central goal of "action-research" is to build a program by which they mean " a coordinated group of activities maintained over a period of time, aimed at

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15. Roy O. Greep, ed., Human Fertility and Population Problems, Cambridge, Massachusetts: Schenkman Publishing Company, Inc., 1963, p. 76.

16. Ibid., pp. 143-144.

fostering a particular type of human change."[17] The controvercy about whether social scientist should commit himself to "basic" more than "applied" research is well known and there is no need to discuss it here. However, in the writer's opinion, it is legitimate for a sociologist to participate in such research since, being a member of society, it is obligatory for him to make a contribution when help from him is expected by society. Besides, by his involvement in action-research the sociologist will also have a chance to make some contribution to the building of basic science, as the action-research activities can also be related to general theory in the social science, verifying the theory or suggesting new formulations.

Fourth, the government expresses concern over maintaining the proportion of Thais in relation to those of other nationalities. The government seems to feel that while the Thais are practicing birth control, those of other nationalities may not. Thus in the future the proportion of other nationalities to the whole population will increase, while the Thai's will decrease. Thus, the Cabinet Council, in a letter dated October 5, 1961 to the Ministry of Public Health, stated that as some other nationalities do not like the practice of birth control it would be a good idea to induce them to change both their nationality and their customs to be Thai.[18]

This anxiety may be lessened if the government would realize that about 98 percent of the whole population are Thais and only 2 percent are

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17. Moye W. Freymann and Herbert F. Lionberger, "A Model for Family Planning Action-Research", in Clyde V. Kiser, ed., Research in Family Planning, Princeton, New Jersey: Princeton University Press, 1962, pp. 443-445.

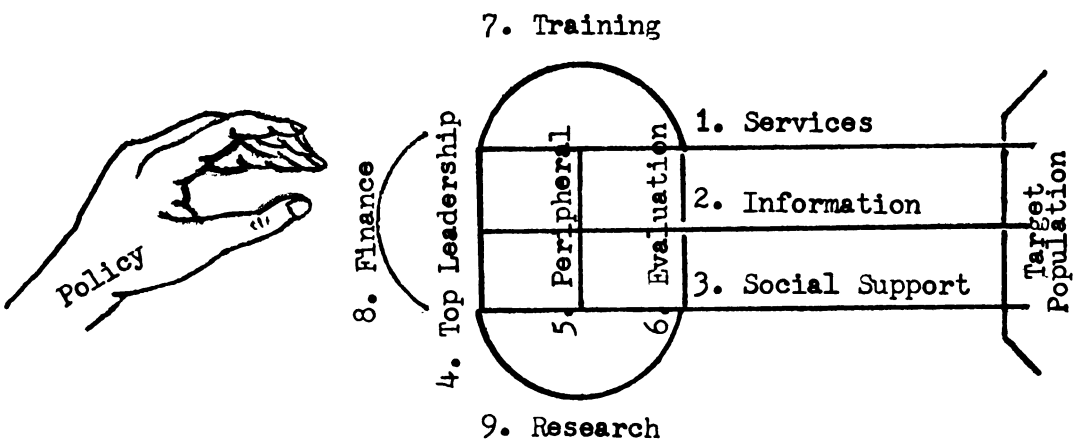
18. Sangad Plengvanij, op. cit., p. 477.

other nationalities. Besides, the majority of the other nationalities reside in urban areas, and in general the urban population tends to prefer small families. Logically, most of them would probably support birth control rather than oppose to it, There is no empirical data, however, for a pertinent judgment on this matter. Survey research concerning this matter would help in making a better plan of action.

The Administrative Aspects

The organizational structure for family planning programs of Freymann[19] is a good model, and it will be used as a guide for the administration of the family planning program in Thailand. The Freymann model of family planning program is analogous to a key, since the program is meant to be a key to a human social problem.

Figure 18. The Freymann model of family planning program



19. Moye W. Freymann, "Organizational Structure in Family Planning Programs," in Bernard Berelson et al., eds., Family Planning and Population Programs, Chicago: The University of Chicago Press, 1966, pp. 321-334.

According to Figure 18, the force behind the key is the hand of public policy. The key itself contains nine lines, each line representing a basic functional element. These elements fall into three groups: instrumental functions, control functions, and supporting functions.

The Policy. Below are the important points that should be included in Thailand's policy for family planning.

1. Family planning should be accepted explicitly by the government as its policy.

2. The project should be a long term one, with sufficient allocation of budget and personnel to gaurantee the continuity of its operation.

3. Propagation of the family planning should be explicit, publicly open, and extensive, with special emphasis on some specific group if such emphasis will make the program more efficient.

4. The family planning should not be seen as an isolated project but as a project operating in the whole fabric of the social structure. Its relationship with social units and institutions as both cause and consequence, should be taken into consideration.

5. Government aid, as an incentive, is a means to accelerate the family planning program. For instance, this may be in the form of free contraceptive divices. At the same time, government aid to the large families should be gradually reduced, and the amount of funds being saved should be transferred to the fund earmarked for the support of the family planning program.

6. If possible, there should be a social security program for the population. Mukerjee held that, "Without the adoption of a scheme of social security, no population can develop the proper psychological

attitude toward family limitation."[20] His reason was that without social security people will continue to think of a large family as affording better security than a small family.

7. Priority should be given to the accomplishment of the compulsory education prescribed in the National Plan of Education. Being able to extend compulsory education from 4 years to 7 years means an additional 3 years of keeping children in school. This will, more or less, help in reducing the feeling of rural people that children are an economic asset, and thus may help change their positive attitudes toward having more children. In other words, the spread of compulsory education will greatly aid family limitation in the rural areas.

8. The age of marriage should be raised to some extent. Actually the average age at marriage of Thai youths is not extremely young, i.e., male about 22 and females about 17. However, if there is any way to promote a higher average age at marriage, say 25 for males and 20 for females, it would shorten the reproductive period and would contribute to family limitation. In addition, it may be argued that the couples at this age are more mature and will act more rationally in having an appropriate number of children.

The Target. It is obvious that the target of the family planning program is the population. But the population is not completely homogeneous and population having particular characteristic and distribution become many targets.

From a strategic point of view, what geographic area should be given priority? Should it be rural or urban, Greater Bangkok or some

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20. Radhakamal Mukerjee, "Motivations and Values," in Clyde V. Kiser, Research in Family Planning, Princeton, New Jersey: Princeton University Press, 1962, p. 547.

other regional area? Conceiving this problem in term of the diffusion of culture, Du Bois saw urban population as the breeders of socio-cultural change, and that socio-cultural change flows from urban to rural areas. He viewed the proletariat, a large proportion of which were peasants who migrated from rural areas to the cities and transformed themselves into proletariat, as the significant carriers of innovations. Du Bois thus made a proposal that the targets of research and action about family planning should be the white collar workers, the proletariat, and the peasantries, respectively.[21] In other words the urban area is the first target and rural area is the second target.

The Du Bois' plan it is felt, would not work well in Thailand. Many reasons can be given to support this position. First, there is a strong taboo against discussion of sex, especially among females. Second, mass-media of communication does not work well among the majority of population, as there is relatively low percentage of literacy (70.8%) and there is a high proportion with a relatively low level of education. Hence, the flow of communication about birth control depends heavily on face-to-face contact. And as talking about sex is regarded as immoral, the spread of birth control through personal contact between different groups is also undependable. Third, the pattern of internal migration in Thailand is greater between different rural areas (and mostly within the same region) rather than from rural to urban areas. Although there is a considerable number of migrants from various regions to Greater Bangkok, there is less contact between the migrants and their relatives and friends back home

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21. Cora A. Du Bois, "Socio-Cultural Aspects of Population Growth," in Roy O. Greep ed., Human Fertility and Population Problems, Cambridge, Massachusetts: Schenkman Publishing Company, Inc., pp. 251-265.

due to the insufficient income to travel back and forth. Thus the proletariat is not the significant carrier of innovation from Greater Bangkok to rural areas. Fourth, according to the conditions mentioned above, if the idea of Du Bois will work at all, it will take a long period of time before a substantial portion of the rural population, the majority of the whole population, will know about birth control. Besides, the information they receive may not clear and may even be incorrect. From an administrative point of view it is not a good policy to spend much resources on a small group of the urban people furst, leaving the larger group of rural people to be treated later. Besides, before the diffusion of birth control from the Greater Bangkok to the rural areas is sufficient to change the attitude of the rural population toward fertility, the population problem may be so intense that it would be virtually impossible to solve.

In contrast to the model discussed, the author believes the following steps and emphases are more adapted to the situation in Thailand: (1) The mass-media, especially radio, should be utilized continually, with an emphasis primarily on urban population; (2) Emphasis in the field operations should be placed on rural areas; and (3) Among the rural areas highest priority should be given to the Northeast where the size of population and the size of family are the largest, but where per capita income is the lowest.

Now, let us examine the geographical aspect and ask which people receive services about birth control. In general, those living in Greater Bangkok are the largest group who receive services, since almost all of the hospitals that render birth control services are located in the Greater Bangkok area. These are some of the important ones:

Woman's Hospital; Chulalongkorn Hospital Family Health Clinic, Vachira Hospital and Somdej Pra Pinklua Hospital. Mc Cormick Hospital in Chiengmai province (Northern region) is the only major hospital outside the Greater Bangkok area that renders services on birth control. According to Tuangpakorn Thampanich, of the total number of 1,200 women who contacted Vachira Hospital for birth control services, 645, or 54%, were residents of Greater Bangkok, and the majority of the remainder were residents of the Central Plain region.[22]

The Family Planning Association of Thailand renders services throughout the whole country, but actually its volume of business is very small. The action unit of the Family Health Project limits its survices within the Photharam district area of the Central Plain region, about 53 miles from Bangkok.

It is felt that knowledge about the problem of population growth, in general, should be taught at the high school level in the classes on social science. This would be a first step in considering the issues involved in the population problem to a large number of young children. Many will not have the opportunity to attend the universities. At the university level, a portion of some course, for instance, rural sociology or introduction to sociology, should include the problem of population growth.

Among the adults, the married couples should be regarded as the most important target. Priority should be given to married couples who already have a large family (say, with 3 children and over) and whose

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22. Tuangpakorn Thampanich, "The Result of IUD Practice Among 1,200 Clientele" (Mimeographed), paper presented to the Second National Seminar on the Population of Thailand, October 12, 1965.

family income is low (according to the standard set up for this purpose). Males should be considered important to the family planning as well as females. One of the three biases of the orthodox birth control movement, as mentioned by Stycos, is the feminist bias. By feminist bias Stycos meant that the pioneers have been ardent feminists. Birth control programs have given emphasis to female methods, female patients, and female benefits. Stycos argues that with respect to family limitation, the male should receive as much attention as the female. Stycos gave three major reasons: First, the male is probably more serious about linking the size of family with income because it is the father who usually takes the responsibility in earning an income. Second, in areas where land is scarce and holdings have become fractionated, the peasant male can hardly fail to see the problem of having additional children. Third, it is usually the male population which is first involved in the process of modernization. Thus the male is in a much more favorable position than the female to be exposed to and influenced by the social changes occuring around him.[23]

The Instrumental Functions.

1. Provision of services. The selection of methods of birth control is, in general, left to the preference of the users. Besides sterilization and abortion which are the ordinary methods used in the hospitals, oral contraceptive are preferred by many especially in areas where the IUD has not been introduced or where it is newly introduced.

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23. J. Mayone Stycos, "A Critique of the Traditional Planned Parenthood Approach in Underdeveloped Areas," in Clyde V. Kiser, ed., Research in Family Planning, Princeton, New Jersey: Princeton University Press, 1962, pp. 481-491.

Ladawalaya Bunharnsupawat's report on the experiment on contraceptive pills and devices for family health shows that 90% of the women receiving birth control aid from the Woman's Hospital used oral contraception.[24] It has to be noted that the period from the beginning of the introduction of IUD by the Woman's Hospital to its clientele up to the date of the report was only five months. In contrast, a report on Family Health Research Project made by Winich Asavasena indicates that the IUD is the most popular contraceptive among its clientele.[25] It should be pointed out that the period from the beginning of the action unit of the Family Health Research Project up to the date of Asavasena's report is about nine months.

Pertaining to the provision of services, the Family Health Research Project started its work in November 1964. A core staff, comprised of two women doctors and four nurses renders services in six clinics placed in different health installations in Photharam district.[26]

2. Provision of information. The two organizations which provide the information on birth control to the public are the Family Planning Association of Thailand, whose scope of work is throughout the whole country, and the Family Health Research Project whose working area is in Potharam district. Field workers were sent out, by the Family Health Research Project, to visit every third house in the district to give

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24. Ladawalaya Bunharnsupawat, "The Experiment on Contraceptive Pills and Devices for Family Health" (Mimeographed), paper presented to the Second National Seminar on the Population of Thailand, October 12, 1965.

25. Winich Asavasena, "Thailand", in Bernard Berelson, et al., eds., Family Planning and Population Programs, Chicago: The University of Chicago Press, 1966, p. 98.

26. Ibid., pp. 96-97.

information and demonstrate contraceptive appliances. Village meetings conducted by medical personnel from the Project were also the means of providing information about birth control to the villagers.

Other means of spreading information in some countries and being recommended by Freymann are: Postal system - printed materials sent with little cost through the postal system to local leaders or individuals; Governmental and industrial groups as sources of information - Besides the organizations whose function is directly concerned with family planning, the government and industrial groups may help in spreading the information by equipping, within their units having close contact with the people, the personnel to answer questions and provide information about family planning; Indigenous communication system - Minstrel and drama troups are also good means to spread the message of family planning. In Thailand each of the natural regions has its own particular folk-singing and drama which can be employed for this purpose.

3. General social support. General social support may come from political organization, religious hierarchies, formal education structure, and community and group-level education. Political parties are likely to be an effective means to legitimize the new ideas (provided that all parties support this policy of the government) and this seems to be the situation in Thailand. As for religious hierarchies, in Thailand, at the present time there is still no explicit statement of attitudes from the high-ranking Buddhist monks. It is rather difficult to say how much cooperation the government will receive from the religious system. As for the formal education structure, it has already been discussed under the sub-heading "The Target". As for community-level education, in many family planning programs, full-time community educational personnel are used as key positions in the community for supporting the family planning

program in general. In Thailand, the government officials of the Department of Community Development who reside in the villages are the right persons to be assigned this role.

Pertaining to group-level education, it is felt that within smaller social units, a critical step in the adoption of an innovation is the achievement of a group consensus that the practice is proper for that particular group. It may be recalled that Du Bois' plan of expanding the information and practices about family planning is thought to be ineffective for Thailand (see p. 144). One of the obstacles to Du Bois' plan is a strong taboo against talking about sex. It cannot be hoped that birth control information can be spread by word-of-mouth from one group to another, for instance, from the white collar group to the proletariat. Even within the same major group, one cannot expect word-of-mouth interaction to spread birth control information. But, in the sense of "group level education" which is being discussed here, the emphasis is put on "small groups" without any reference to the classification made by Du Bois. Within the small group the members are so intimate that birth control can be discussed. If the leader of the group can be convinced that his attitude about family limitation is positive, he will influence the others, and when all the members have the similar attitudes, birth control will probably be practiced by all members of the group.

The Control Functions. The family planning program, because of its newness and urgency in Thailand calls for leadership of high status to ensure that, within his authority, the program will be carried on by other units under his control and that cooperation from other government units will be gained. In Thailand the program is placed under the responsibility of the Ministry of Health.

Personnel who take the responsibility at the national and provincial levels must be carefully selected. At the same time these men must be vested with a larger degree of authority and freedom in making decision and in financial action to prevent the unnecessary delay of work. However, these persons have to report to the top leader regularly so that he can evaluate the progress of the program.

As for peripheral supervision there should be a strong vertical line of technical supervision. Specialized technical supervision from above will help the members of the lower staff levels solve the problems which are beyond their capacity. Evaluation of the operation and progress of the program is essential to the future progress as problems will be corrected and improvement of work will be obtained from the information derived from the evaluation.

The Supporting Functions. Included in the supporting functions are training, finances, and research.

A training center, of course, needs to be set up. The training center faculty must work closely with the field service organization. Full utilization of experience in the field as a guide for the improvement of the operation is to be recommended.

Sufficient and long-term financial support is essential to guarantee the continuity and the success of the program. In India, it was found that the lack of long-term financial assurances was the most serious single factor inhibiting the progress of the family planning program. At the same time, special committees may be set up at the national and the provincial levels. These special committees will help to increase fiscal flexibility, preserve fiscal responsibility, and bring various official departments and private groups to involvement with the program.

Research and evaluation should be an important function in the family planning program. Research will be required in reproductive biology, clinical contraception, population statistics, socio-cultural aspects of family planning, and economic of family planning. Researchers from different fields may carry on research independently, but should keep in mind the relationship of their intellectual fields to other fields, to the whole program, and how their research contributes to the progress of the family planning program. Research funds in Thailand may come from the budget of the organization in which the researcher is located. Funds for research are also provided by the National Research Council, but the supply is usually smaller than the demand. Funds for research may be asked from foreign organization, for instance, the Population Council, and the Agricultural Development Council.

The Family Action-Research in Photharam District[27]

The family action research in Photharam district is under the Family Health Research Project. Administratively, it is an integration of research and action into one administrative unit, known as "action-research" program. Photharam which is a rural district of Ratburi province, has about 70,000 population, located some 53 miles west of Bangkok and can be reached by water-way, train, and car.

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27. Report on the Family Action Research in Photharam District may be found in these places:
    1. Winich Asavasena, et al., op. cit., pp. 95-104.
    2. Amos H. Hawley and Visid Prachuabmoh, "Family Growth and Family Planning in a Rural District of Thailand," in Bernard Berelson, et al., eds., Family Planning and Population Programs, Chicago: The University of Chicago Press, 1966, pp. 523-544.
    3. Amos H. Hawley and Visid Prachuabmoh, "Family Growth and Family Planning: Responses to a Family-Planning Action Program in a Rural District of Thailand," in Demography, Vol. 3, No. 2, 1966, pp. 319-331.

In August, 1964 a sample survey of knowledge, attitudes, and practices regarding family planning was undertaken in Photharam district. Three months after this, an action program providing family-planning advice and appliances was inaugurated in the district. In August 1965, a period of eight months after the action program had been in operation, a second field survey, modeled after the first, was completed.[28] From the research point of view, this operation is known as the "projected successional experiment," i.e., experimental research which is concerned with cronological comparisons of effects in a single group over a period of time.

Both surveys employed a 25 percent simple random, though non-overlapping, sample of married women 20-44 years of age whose husbands were living. The only difference in design and execution was the inclusion in the resurvey of questions about the action program. The method used in the two surveys was the same, i.e., the interview. Each household in the samples was visited by a trained midwife interviewer and interviewing was conducted in the respondent's house. The total interviews of the first survey was 1,207 and that of the second survey was 1,337. With a few exceptions, the characteristics of the two population samples were so similar that differences in knowledge, attitudes, and practices could be regarded as effects of the program.

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28. The research and the action program were supported jointly by the Population Council and the Government of Thailand. Dr. J. Y. Peng, the Population Council Medical Advisor to the project, designed and provided continuous technical assistance to the action program. Dr. Winich Asavasena, Chief of the Maternal and Child Health Division of the Department of Health is the supervisor of the action program. The surveys were designed by Professor Amos H. Hawley; and the field operations were supervised by Mr. Visid Prachuabmoh.

Summary of the Findings of the Resurvey

The resurvey revealed a substantial progress of the action program. Nine of every ten women thought the program should be extended over the entire country. Twenty-three percent of the women who at the first survey disapproved of the practice changed their attitudes to approval, mainly because they had become convinced of the harmlessness and the benefits of birth control. Less than 3 percent of the former approvers had become negative. During the eight months of the program's operation the proportion of women who claimed some kind of knowledge about contraceptive methods was more than double. The actual practice of birth control rose from 1 to 21 percent of the eligible women (women who were not pregnant, subfecund, or sterilized). Another 16 percent of the women in the resurvey planned to practice birth control in the near future. Among the women who were approaching or had already attained the ideal number of children (4 children) the frequency of actual practice of birth control exceeded the expected frequency. Only a small number of women 40 years old and over accepted clinical assistance.

The General Socio-Economic and Demographic Characteristics of the Samples' Population

Type of Family. Concerning type of family, the data from the two surveys were almost identical. The data from both surveys indicated 53% of nuclear families from the total households; 36% of extended families; and 4% of unclassified families. The only differences were that the data of the year 1964 indicated 1% of the families having man and wife without children, while there was none of this type in the year 1965; and that the conjugal family of the year 1964 was 6% while that of the year 1965 was 7%.

Size of the Household. The average size of household in the 1964 sample was 7.0 persons, while that of the 1965 sample was 7.2 persons. These were larger than the average household of the whole country which was 6 persons.

Occupation. The 1965 survey affirms the finding of the 1964 study that about 63% of the household heads are engaged in agriculture. This proportion was smaller than that of the whole country which was about 78%. Of the remaining households, the data of the 1964 survey showed that 14% of the heads were engaged in white-collar occupations and 21% were craftsmen and service workers of various kinds. Less than 2% of all household heads were unemployed. Hawley and Prachuabmoh stated that the distributions between white- and blue-collar of the 1965 survey were not identical with that of the year 1964, but the diferences were slight and thus could be ignored.

Size of farm. The 1964 survey indicated that one-third of the farm families had a farm which was inadequate to feed their families. The average size of farm of these families was 4.1 acres and average size of household was 7.4 persons. Those who declared that their lands were adequate lived on farms of 7.8 acres on average and an average size of household of 6.8 persons.

Age of the Respondents. The age structure of the Photharam district is different from both the Ratburi province within which it is located and from the country as a whole. Percentage of the respondents in the age-group 20-24 of both surveys was only one half of that of the whole country, while the percentage of the age-group 40-44 of both surveys was much higher than that of the whole country. The fact was that a considerable number of the youths migrated from the district. Hence, there was

a large proportion of older people in the remaining age-groups.

Table 31. Percent distribution of respondents in two Photharam samples, by age, and of corresponding married women in 1960 census for Ratburi and country as a whole

Age of respondent	Photharam samples		1960 census	
	1964	1965	Ratburi	Kingdom
All ages	100	100	100	100
20 - 24	10	9	18	20
25 - 29	23	18	24	25
30 - 34	26	23	24	23
35 - 39	22	28	18	18
40 - 44	19	22	16	14

Source: Demography, Vol. 3, No. 2, 1966, p. 321.

Education. Educational level of the two samples were similar. Three percent of the wives and 11 (1964) to 12 percent (1965) of the husbands had completed five or more years of formal schooling. In both samples the proportion of illiteracy was 20 percent. But among the literates less than 10 percent ever read any printed matter.

Mean Age at First Marriage. In each survey the average age of husbands was found to be a little more than three years above that of the wife (3.2 years in 1965; 3.5 years in 1964). The mean age at which women married for the first time was 21.0 and 20.7 for the 1964 and 1965 samples respectively.

Socio-Economic Characteristics and Live Births

Modernization and Live Birth. From the 1965 sample it was found that as degree of modernization increased the number of live births decreased. Scale values of modernization were derived from the sum of the weights assigned to each of several possessions (for example, automobile: 15; television: 7; electric iron: 6, radio: 5, etc.).

Table 32. Modernization and live births, Photharam sample, 1965

Modernization scale	Live births per woman
Under 5	5.1
5 - 9	4.9
10 - 14	4.6
15 - 19	4.4
20 & over	4.4

Source: Demography Vol. 3, No. 2, 1966, p. 325.

Education, Occupation, and Size of Farm. The data showed that as the number of years of formal school increased the number of live births per woman decreased. The data showed that live births of 5.6; 4.4; and 3.5 correspond to the formal school year completed of 0; 1-4; and 5 & over, respectively. The live births per farm-woman was 4.9 while that of the non-farm woman was only 4.2. As for size of farm and fertility there was no clear relationship.

The Ideal Number and Actual Number of Children

From Table 33 it will be seen that the "ideal" number of children in the 1965 sample was only 0.2 higher than the 3.8 children per woman in 1964 sample. In both samples the ideal number exceeded the actual number in the younger age groups, was equal the actual number in the 30-34 age-group (except in 1964 where the ideal number is only .1 less than the actual number), and fell below the actual number among women above 35 years of age. See Table 33.

Table 33. Number of living children and "ideal" number of children per woman, by age, 1964 and 1965 Photharam samples

age	1964		1965	
	Living children per woman	"ideal" children per woman	Living children per woman	"ideal" children per woman
All ages	3.8	3.8	4.0	4.0
20 - 24	1.3	2.8	1.5	3.2
25 - 29	2.6	3.4	2.5	3.6
30 - 34	3.7	3.6	4.1	4.1
35 - 39	4.6	4.1	4.7	4.3
40 - 44	5.2	4.2	5.4	4.3

Source: Demography, Vol. 3, No. 2, 1966, p. 325.

Change in the Level of Motivation

In order to find out the change in level of motivation resulting from the action program in the two surveys, the same three attitude questions were asked:

1. "If you knew of a simple and harmless way of keeping from getting pregnant too often or having too many children, would you approve of its use by married couples?"
2. "Would you like to do something to keep from getting pregnant in the future?"
3. "Are you interested in learning more about keeping from getting pregnant too often or having too many children?"

The answers to these questions were combined to form a rough scale of motivation. Those who answered all three questions affirmatively were designated "highly motivated." Those who gave positive answer to the second and third questions, but who were rather negative to the first question i.e., showing a hesitant approval of contraception as a general practice, were regarded as "moderately motivated." Women who disapproved of contraceptive practice but who wish to engage in it anyway were categorized as having a "qualified motivation." Those who disapproved of contraceptive practice but wish to learn about it were categorized being "potentially motivated." Those who answered the three questions negatively were "not motivated." Those whose answer were so inconsistent (even more negative than those who were designated as "not motivated") were described as "inconsistent."

The data in Table 34 indicate a considerable increase in the level of motivation during the year since the first survey. The proportion of "highly motivated" increased by 3 percentage points to 43 percent, while the cumulative proportion of all degrees of positive motivation increased from 68.4 to 74.9 percent. The proportion of "not motivated" declined from 24 percent, in 1964, to 7 percent, in 1965.

Table 34. Percent and cumulative percent distribution, by motivation class, 1964 and 1965 Photharam samples

Motivation class	1964		1965	
	Percent	Cumulative percent	Percent	Cumulative percent
Total	100		100	
Highly motivated	39.7	39.7	43.0	43.0
Moderately motived	6.2	45.9	13.1	56.1
Qualifiedly motivated	9.8	55.7	1.2	57.3
Potentially motivated	12.7	68.4	17.6	74.9
Not motivated	24.2	92.6	7.0	81.9
Inconsistent	7.4	100.0	18.1	100.0

Source: Demography Vol. 3, No. 2, 1966, p. 327.

Further exploration of attitude change was done by the direct question "Has your opinion toward the use of methods to keep from getting pregnant too often or having too many children changed in any way during the past year?" The responses to this question indicate a shift of 23% from disapproval (1964) to approval (1965), while only 2.5 percent of the former approvers shifted to disapprovers. The largest changes took place in the age-group 25-35. The reasons given for change from disapproval to approval were: the respondents have learned that contraception is not harmful to health; a friend has used contraception satisfactorily; and the respondents have decided that family limitation is a good thing to do.

Another interesting point about motivation is that over four-fifths of the women were aware that the decline in the death rate had reduced the number of births they need to have in order to realize a given number of living children.

Knowledge and Practice of Contraception

In the 1964 sample, two-thirds of the women interviewed had absolutely no knowledge about methods of contraception, but in the 1965 sample only 12% of the women claimed ignorance of contraception. Ignorance was greatest among those with no education, and least among women with five or more years of education. Among those who claimed having knowledge about contraception, those with higher levels of education had a wider knowledge of the many methods available.

In 1964 only eight women (less than 1 percent) were currently practicing contraception and only 19 (1.6 percent) had ever practiced contraception. By contrast, in 1965, 181 women were currently practicing some form of contraception, exclusive of sterilization. This represents 21 percent of all eligible women in the sample (women who were not pregnant, subfecund, or sterilized). It was found that 29 percent of all couples who were not subfecund or who did not have a current pregnancy had done something to limit reproduction.

Contraceptive users were concentrated in the age-group 25-39 years. Contraceptive use increased with age until age 40. The major reason is that among the younger age-groups the ideal number of children had not yet been realized while among the oldest age-group most of them already had the number of children they desired and that there was greater resistance to innovation among older women. Contraceptive

practice among some women with one or two children was primarily for child-spacing purposes.

Table 35. Number of ineligible and eligible women and number and percent of contraceptive users, by age, 1965 Photharam sample

Class of women	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	All ages
Total number	124	242	303	377	291	1,337
Number pregnant	38	53	55	47	20	213
Sterilized *	1	15	23	41	23	103
Subfecund ** never pregnant, married 3 or more years	2	4	-	5	8	19
No live birth since 1959	1	1	18	38	68	126
Number eligible women	82	169	207	246	172	876
Contraceptive users number	8	33	53	69	18	181
Percent	9.8	19.5	25.6	28.0	10.5	20.7

* Wife or hunband
** Never practiced contraception

Source: Demography Vol. 3, No. 2, 1966, p. 330.

Actually, apart from the 181 contraceptive-users, there were another 321 women who wanted to do something to keep from getting pregnant too often or having too many children. This indicates that 57 percent of the eligible women were either practicing or want to practice contraception at a future date. Now, if the sterilized couples are added to both numerator and denominator, the proportion who have done something or plan to do something to limit family size will rise to 62 percent.

CHAPTER VI

FOOD PRODUCTION

> "To me, it is disturbing that so many people think of the population problem only as numbers of people versus available food. This seems to equate man with animal and food with fodder."[1]

When John D. Rockefeller 3rd made the above statement in his opening remarks to the International Conference on Family Planning Programs, at Geneva, 1965, he did not mean to deny or denigrate the importance of food production in relation to the population problem. He only wanted to point out that there are considerations beyond the problem of food production at the subsistence level. There are the moral, spiritual, and intellectual aspects of life which cannot be omitted from the solution of the population problem. Who would argue that the population problem is solved "until society can offer every individual an opportunity to live - in the fullest sense - as well as to survive"?

Nevertheless, in the discussion of population problems in the underdeveloped countries where food production is barely keeping pace with population growth, it is both customary and logical that food production receives the first priority. Here, the discussion concerning food production will concern two questions: (1) Will Thailand be able to feed her increasing population? and (2) Will Thailand be able to

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1. John D. Rockefeller 3rd, "Opening Remarks" in Bernard Berelson, et al., eds., Family Planning and Population Programs, Chicago: The University of Chicago Press, 1966, p. 3.

increase rice production to the level that there is a surplus of rice for export?

The Over-All Aspects About Food Production

The first thing to be pointed out is that, compared with many other developing countries, Thailand is a relatively abundant country. There has been no starvation in her history. Besides, there are always surpluses of foods being exported for foreign currencies. The main source of revenue derives from rice export.

Rice is the staple food of the Thais. The main sources of protein are fish, poultry, and livestock. However, fish is the most important source, as Thailand is rich in water resources and thus fish is the common source of protein that common people can find everywhere. The abundance of fish, however, is now diminishing.

Agricultural Land

Of the total land area of 128 million acres, 32 million acres, or 25 percent, are used for agriculture, of which 20 percent are under cultivation and only 5 percent are left uncultivated.[2] Nearly three-fourths of the cultivated area consists of rice farms, while the remaining one-fourth is devoted to other crops, such as coconuts, para rubber, field crops, and fruit trees.[3] About 82.7 percent of all farmers own their cultivated land; 17.3 percent are renters. Over half of the renter are farmers of the Central Plain.

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2. For more details about land use see Chapter IV pp. 100-101.

3. Ministry of Agriculture, Agriculture in Thailand, Bangkok: Parkdi Pradit Press, 1961, p. 1.

Labor Force In Agriculture

About 81% of the labor force is employed in agriculture which includes fishery and forestry. The majority are engaged in rice farming. The level of education of the labor force in agriculture is relatively low. The degree of their exposure to the mass media of communication is low, and hence their world view is relatively narrow and traditional. Family labor has been utilized extensively. The number of female workers is slightly larger than male. The size of the labor force in agriculture is gradually declining due to the shift of employment between agricultural and non-agricultural sectors.[4]

Production

Self-sufficing economy still prevails in most parts of Thailand. Farms are small in size, approximately 10 acres per farm family. Surplus is low, thus cash income is inevitably low. In general underemployment exists among agricultural labors. Farm tools used are simple and technique of farming is rather primitive. This results in low yields. A farmer is able to feed only about two other peoples.[5]

With the exception of rice which is the major food crop, other important food crops are maize, mung beans, cassava, and varieties of fruits and vegetables. The important livestock includes buffaloes, cattle, swine, and poultry. Fisheries, both fresh water and marine yield a substantial food source.

Food surplus is large enough so that export of rice exceeds a

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4. Details about labor force are in Chapter III pp. 73-76

5. Chaiyong Chuchart, Agricultural Economics of Thailand, Bangkok: Mongkol Kanpim, 1960, p. 14.

million tons annually. Other exported food crops are: maize, mung beans, ground nuts, soy beans, coconuts, cassava, other kinds of beans, other food products made from these food crops, and fruits. A considerable amount of fish, both fresh and marine, is also exported annually.

Rice Production

Rice is the staple food of the Thais. It is so important in their lives that, in their language, the words "rice" and "meals" are synonymous. Besides, rice has been the main crop of Thailand, upon which the main economy of the country depends. Rice alone accounts for more than 50 percent of the total export which is the basis of foreign credit. Therefore the production of rice can be used as the indicator to answer both questions, i.e., whether Thailand is able to produce food enough for her increasing population and whether there will be surplus of rice for export.

Area of Production

Of the total area of agricultural land which was about 26 million acres in 1960, 17.6 million acres were rice farms. Of this 17.6 million acres, about 14.6 million acres were planted area as of 1960, The total yield of rice was about 7.8 million tons. Rice production is found dotted throughout the whole country, but the major area is the whole Central Plain. The distribution of rice production by regions is shown in Table 36.

Table 36. Area of rice production by region, Thailand, 1960

Region	Percentage
Central	47.2
Northeast	38.1
South	8.0
North	6.7

Source: Chaiyong Chuchart, "Agricultural Economics of Thailand."

Methods and Techniques of Rice Cultivation

Broadly, the practices of rice cultivation in Thailand may be summed up in two methods: dry-land rice and wet-land rice. The wet-land rice may be cultivated either by broadcasting and transplanting. In general, most of the Thai farmers still retain their traditional way of farming. Water buffaloes still remain the prime power and are indispensable to the rice farmers. The wooden walking-plough with a steel share is standard equipment. Harvesting is still done by hands with the old type of sickle as the equipment.

Modern farming techniques are being tried by some farmers. This includes rice breeding where the center of the project is the Rangsit Rice Experiment Station. Hybrid seeds may be obtained from agricultural experiment stations throughout the country, and thus it seems that among the agricultural innovations, the use of better seeds receives more interest from the farmers than most other practices. Fertilizer application has been practiced by a number of farmers. The main factors

inhibiting the diffusion of chemical fertilizer application among the farmers are: inadequate dissemination of right information, lack of widespread demonstration, and lack of funds to purchase fertilizer. As for mechanization, a small, cheap gasoline or diesel motor has become increasingly popular among Thai farmers as an all-round source of power and labor saving machine. Efficient, low cost tractors named the "Iron Buffaloes", designed and tested under actual field conditions by the Department of Rice, will be produced and sold to the farmers in the future.

According to the Ministry of Agriculture, a second cropping of rice is practiced on only about 50,000 acres scattered all over the country wherever local conditions permit.[6] With the completion of the Greater Chao Phya Project of irrigation it is hoped that a second crop could be cultivated on about 900,000 acres.[7]

Yield of Paddy

Within a period of about half century, from 1907 to 1960, the total yield of paddy has rising slowly. The average total yield of the year 1907-16 was only 3.0 million tons. In 1940 it rose to 4.6 million tons, and in 1960 to 7.8 million tons.

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6. Ministry of Agriculture, op. cit., p. 21.

7. International Bank for Reconstruction and Development, A Public Development Program for Thailand, Baltimore: The John Hopkins Press, 1963, p. 39.

Table 37. Rice production in Thailand: planted area and total yield, 1907-1960

Year	Planted Area (million acres)	Total Yield* (million tons)
1907-16	0.6	3.0
1917-26	6.3	4.0
1927-36	7.9	4.4
1940	8.5	4.6
1950	13.7	6.8
1960	14.6	7.8

* paddy

Source: Data 1907-1940 from Ministry of Agriculture, "Agricultural Statistics of Thailand", 1961. Data 1950-60 from Ministry of Agriculture, "Agricultural Statistics of Thailand", 1962.

Although somewhat fluctuating, the average yield per acre in the long-run from 1908-1964, shows a downward trend. The average yield per acre for the years 1908-1912 was 704 kilogram per acre, while that for the year 1960-1964 was only 562 kilogram per acre. This difference is a reduction of 142 kilogram per acre. It seems that the best explanation of this reduction of yield per acre is the exhaustation of land. However, in the short-run period from 1946 to 1964 it is seen that the trend seems to be one of gradual increase. At present, there is no information to explain this short-run upward trend, but it probably be the result of the new rice breeding and, perhaps the proportion of farmers using fertilizer has increased. Anyway, at present this short-run upward trend of paddy yield per acre may not continue. To be

certain, perhaps, waiting to see the yields of another ten years will be necessary.

Table 38. Paddy yields per acre, Thailand, 1908-1964

Year	Paddy Yields Kg. / Acre
1908 - 1912	704
1913 - 1917	608
1918 - 1922	610
1923 - 1927	671
1928 - 1932	570
1933 - 1937	542
1938 - 1942	570
1946 - 1950	489
1951 - 1955	499
1956 - 1960	499
1960 - 1964	562

Source: Siribongs Boonlong, et al., "The Proportion between quantity and Income from Agricultural Product and the Population size of Thailand", paper presented to the Second National Seminar on the Populations of Thailand. (Mineographed)

In a brief summation, the trends of rice production in the long-run are: (1) increasing area of production; (2) increasing total yield and (3) decreasing yield per acre. The summation indicates that rice farming in Thailand from the past up to present time is still of the "extensive" type. In order to get a larger total yield, more planted area is needed.

It also indicates that there is ample room for the improvement in production methods.

Food Production and Future Population

Now it comes to the point that the question of whether Thailand will be able to feed her increasing population must be addressed. In order to answer this question, let us look first at the data in Table 37. In 1940 the total yield of paddy was 4.6 million tons; and in 1960 it was 7.8 million tons. This indicates an increase of 3.2 million tons within the period of 20 years. The rate of increase in rice production during this period amounted to about 3.5 percent per year while the rate of population growth from 1947 to 1960 was about 3.2 percent. Thus the rate of food production was .3 percent in excess of the rate of population growth.

According to the population projections made by Gille and Chalothorn, the population of Thailand in 1980 would range from a low of 48 millions to a high of 54 millions. Assuming that an average person consumes 188 kilograms of paddy per year,[8] the 48 million population (lowest projection) would require about 9.0 million tons of rice per year; the 50 million population (moderate projection) would require about 9.4 million tons; and the 54 million population would require about 10.2 million tons of paddy.

First Assumption[9] Assuming that there is a yearly fluctuation in

8. This figure of 188 kilograms consumption of paddy per year, per person is from Prakrit Bhamonchant, "Increasing Agricultural Production and the Increasing Population of Thailand," a paper presented to the Second National Seminar on the Population of Thailand, 1965. (Mimeographed)

9. Assumption of Prakrit Bhamonchant: See Ibid.

rice production and that there is no certain trend of the increase in total yield, and also assuming that in the year 1980 total yield of paddy will equal that of the year 1962, (i.e., 9.2 million tons, the highest yield Thailand ever produced in the past fifteen years) then in the year 1980 Thailand would have produced barely at subsistence level for a population of 48 millions. If the number of population at that year would be higher, say 50 or 54 millions, then there definitely would be hunger!

Second Assumption Assuming that the rate of increase in rice production at 3.5 percent per year will continue, then in the year 1980 the total yield of paddy will be about 13.3 million tons. This total yield will be more than sufficient to feed even the largest projected population i.e., 54 millions, because the requirement for this number is only 10.2 million tons of paddy. The important point, here, however, is how can it be certain that the 3.5 percent rate of increase in rice production will continue?

In order to clarify the answer to the above question, two points should be considered. First, with the present conditions of production, will the increased trend of production continue? Second, is there any possibility to accelerate the rate of production? In regard to the first point, it means that the same total planted area of the year 1962, which is 16.4 million acres[10] will be utilized. For other "present conditions" it is assumed that at present there exist some factors which help to enhance the effeciency in rice production, and this is reflected in the increasing in yield per acre, i.e., the average yield per acre

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10. Ibid.

has risen from 489 kilograms of paddy per acre during 1946-1950, to 562 kilograms per acre during 1960-1964. This may have been due to any of these factors or the combination of some of them: the increasing number of farmers who used better seeds, application of fertilizer has been increased in recent years; pest and disease control have been applied to more farms by the help of the government agencies; and increase in number of farms where second cropping can be practiced due to the improvement of irrigation systems. One or more of these improvements is possible, because these innovations were first introduced to the farmers at least prior to the World War II, and some innovations have gained some popularity among an important fraction of farmers.

The implication of the above discussion is that even with the existing conditions, the present increased rate of rice production will probably continue. Now, concerning the second point, if it is possible for Thailand to accelerate her rate of rice production and increase the total yield, the answer is definitely affirmative. At present, rice production in Thailand has not yet reach its full capacity. All the available land has not yet been brought under cultivation and all scientific techniques have been applied to only a fraction of all farms. An increased total yield can be done by bringing all of the uncultivated land (5% of the total agricultural land) under cultivation. Increased rate of production or yield per acre can be accomplished by the application of scientific methods and techniques to as many farms as possible. In fact, there is much opportunity left for combining the capacity of land with other factors to produce higher yield per acre in Thailand. During 1956-1960, for instance, paddy yield of Japan was about 1,466 kilograms per acre, while that of Thailand was only 562 kilograms per acre. The target

of rice production in Thailand thus should be to double the yield per acre. In a democracy, this goal depends heavily on the performance of the agricultural extension officials: how well can they demonstrate the innovations to farmers and how well can they convince the farmers to apply scientific techniques to farming? Another point has not yet been considered. Second cropping is another possible way which can substantially increase yield per acre. At present only a fraction of the total farms can practice second cropping. With the improvement of irrigation systems the proportion of rice farms where second cropping can be practiced will rise considerably. The Greater Chao Phya Project of irrigation alone will permit second cropping on about 900,000 acres of land. If this figure is right, then in future, yield on these 900,000 acres will rise substantially since they would probably double their yields per year.

From many reasons given in the previous discussions it is felt that present rate of increase in rice production will probably continue, and in 1980 Thailand will be able to produce about 13.3 million tons of paddy, an amount sufficient to feed the largest projected-population of about 54 millions, and will have about 3 million tons of paddy left for export. If the limitation of family size is accepted among the people the future population will be smaller and the amount of rice surplus will be larger.

From Table 39 it will be seen that within the past 7 years Thailand has exported rice at an average of about 1.5 million tons annually. The highest figures are for the years 1964 and 1965 which are as high as 1.9 million tons. Rice exports in the first half of the year 1967 is 933,613 metric tons, or 131,183 tons lower than for the same

period in 1966. It is expected that the total rice yield of this year will be smaller due to the drought during planting season. A good portion of rice left over from last year will be kept for next years' consumption and thus the total export of rice this year will be smaller.

Table 39, Rice export, Thailand, 1960-1966

Year	Weight (million metric ton)	Value ($ million)
1960	1.2	128.5
1961	1.6	179.9
1962	1.3	162.0
1963	1.4	171.2
1964	1.9	219.5
1965	1.9	218.8
1966	1.5	199.7

Source: "Bangkok Bank Monthly Review," July 1967.

It is probable under present conditions of rice production sufficient rice will be produced for internal consumption and for export only in the short-run. But, in the long-run there is no guarantee for this, because population tends to increase more rapidly than food. In short, extensive-cultivation will enable the Thai to live above subsistence level only at present and for a short-run period in the future. But in the long-run, if the same level of abundance will be maintained, Thailand must shift her old methods of rice production to intensive cultivation.

Production of Other Major Food Crops

Corn

Thailand has a long wet season which permits two crops of corn a year. Corn can be grown in most parts of the country, but the real expansion of corn production took place after the World War II due to the increasing demand from foreign countries, particularly Japan. A large proportion of the corn produced is for export. In 1958, of the total yield of 186 thousand tons, 163 thousand tons, or about 89% was exported.[11]

The expansion of corn production during the past fourteen years is substantial. During the years 1953 to 1958 the increase in the total yield was about four times, or from 51 thousand to 186 thousand tons.[12] From the year 1958 to present the increase in yield has been tremendous. The amount of corn exported during the first half of 1967 alone was about four times as much as the total yield in 1958. Since corn is generally being consumed throughout the country (although it is not a staple food) and since expansion of production is not difficult, it is obvious that it can be a good substitute for rice, if, rice should become short or insufficient to feed the growing population.

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11. Ministry of Agriculture, op. cit., p. 28

12. Ibid.

Table 40. Main market for Thai corn, 1967 (January - June exports)

Main Markets	Exported Weight (metrict tons)
Japan	375,447
Taiwan	48,235
Singapore	37,595
Hongkong	30,455
Malasia	26,693
Total (six months)	518,425

Source: "Bangkok Bank Monthly Review," July 1967.

Cassava

Cassava is another food crop being consumed throughout the country. It has become an industrial crop which brings into the country a large income from the export of its flour. Large areas where cassava is grown as a commercial crop lie along the Southeastern coast of the country.

Table 41. Production of cassava and the export of its flour, Thailand, 1957-1959

Year	Production (thousand tons)	Export of tapioca flour (thousand tons)	Value (million dollars)
1957	417.6	77.0	6.0
1958	487.0	124.7	8.9
1959	597.1	142.1	8.8

Source: Ministry of Agriculture, "Agriculture in Thailand."

Other Food Crops

The other food crops that should be mentioned are mung beans, sugar cane, coconuts, fruits and vegetables. Sugar cane production is only enough for internal consumption and amounts to 70,000 tons annually. The surplus of mung beans and coconuts, however, is being exported. During 1961 about 26,447 tons of mung beans with a value of about $3.0 millions, and during 1955 about 6,820 tons of coconut products with a value of about $469 thousands, were exported.

The soils and climatic conditions in various parts of the country are ideal for the production of tropical fruits and vegetable of all kinds. It is customary for the people to grow at least some kinds of fruit trees around the house for shade and for extra income from the sale of surplus fruits. This is also true for vegetables. In numerous localities, however, specialized gardens and orchards produce commercial fruits for the purpose of supplying local markets as well as for export to nearly countries. Oranges, pomelos, and tamarind are the principal fruits exported, and the leading markets for the Thai fruits abroad are Singapore and Hongkong.

Livestock, Hogs, and Poultry

Production of livestock is sufficient for home demand to be used as draft animals and as food, and there is a small number left to be exported. In 1961, about 68.9 thousand head of buffaloes and 55 head of bullocks and cows, the total value of both of which was about $6 millions were exported. In order to improve milk production a dairy project was recently set up by the Ministry of Agriculture with aid from the Danish government. An experiment station in the Northeast, under the supervision

of the Danish experts is now conducting an experiment on rasing Danish bulls and cows. The success of the project means the expansion of good milk cows throughout the country, and this means an increase in milk production. As for hogs, in 1961 a surplus of 80,713 head with a value of $1.9 millions were exported. The improvement of hog breeding is now underway. In every agricultural experiment station throughout the whole country good boars are available for cross-breeding with the native sow. It is thus hoped that in future hogs of good quality will increase in number.

Since the last war, the Thai poultry industry has made considerable progress. The production is large enough to meet the demand for home consumption and yet there is surplus left for export annually. In 1961 a total of 779,587 head of poultry was exported, bringing the total amount of $422 thousands to the country. The improvement and expansion of egg-production is now underway. The best laying strains of White Leghorn, Rhode Island, Barred Plymouth Rock and the New Hampshire were ordered from the United States and the Australorps from Australia, for this purpose. These birds and their hybrids lay so well (highest record 322 eggs in 365 days) that there is an increased interest by many in egg-farms. About 100 poultry farms ranging from 250 to 3,000 bird capacity recently sprang up on the outskirts of Bangkok. Many more are due to appear.[13]

Fisheries

Fisheries rank next only to agriculture in the extent and value among the basic industries of the country. Fisheries have a three-fold

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13. Ibid., p. 214.

importance: as a source of protein food, as a means of livehood for a large proportion of the population, and as a rich source of revenue to the government.

Marine fishing grounds of Thailand comprise about three-fourths of the coastal waters of the Gulf of Thailand and a long section of the eastern shore of the Indian Ocean, the total length of the coastline being over 2,500 kilometers.

Table 42. Production of fisheries, Thailand, 1948-1961 (catch landed-weight in thousand metric ton)

Year	Catch Landed-Weight		
	Freshwater Fisheries*	Marine Fisheries**	Total
1948	41.0	120.0	161.0
1953	56.3	148.7	205.0
1954	63.4	166.4	229.8
1955	61.6	151.4	213.0
1956	65.7	152.2	217.9
1957	68.1	166.4	234.5
1958	51.3	145.0	196.3
1959	57.0	147.7	204.7
1960	75.3	145.6	220.9
1961	72.4	233.2	305.6

* Includes fishes and prawns
** Includes fishes, prawns, shrimps, and molluscs

Source: FAO, Yearbook of Fishery Statistics, Vol. VI, 1955-56.
FAO, Yearbook of Fishery Statistics, Vol. XIV, 1961.

Fresh-water fishing grounds of Thailand include many large interior rivers, of which those in the central area form, with innumerable canals, an extensive net-work, including many lakes, swamps and streams of large volume, and in which enormous amounts of valuable fish are found.

Marine fish are more important, as a source of food, than the fresh-water fish. As seen in Table 42, the total catch of marine fisheries is larger than that of the freshwater fisheries for every year shown. In 1961, for instance, the total catch of freshwater fisheries was 72.4 thousand tons, while that of the marine fisheries was 233.2 thousand tons. The total catch fluctuates from year to year. However, an attempt is being made by the Department of Fishery to increase the catch. As for marine fisheries, a new research program is being developed to find new trawlable grounds to increase production. A survey of new trawlable ground in the Gulf of Thailand and Indian Ocean has now been completed.

As for the improvement of freshwater fisheries, a program for the development of fish-culture was initiated by the Fisheries Department some 20 years ago. With the establishment of four Inland Fisheries Stations, the program has made slow but steady progress. Since the middle of 1951, with the introduction of "Tilapia mossambica", the provision of the technical services from FAO, the supply of field equipment from AID, an extensive fish-culture extension scheme has been implemented. "Tilapia", because of its fast reproduction and growth, has become the most popular pond fish in Thailand. It is expected that before long it will be one of the common fish of the country. It is especially valuable for the inland provinces which are located some distance from the sea and the main rivers where there is a pressing need for fish.

Table 43. Exports of fish,* Thailand, 1957-1963

Year	Wieght (thousand metric tons)	Value ($ million)
1957	19.1	3.2
1958	12.1	1.7
1959	8.5	1.3
1960	7.8	1.4
1961	9.1	1.7
1962	7.5	1.5
1963	6.9	1.2

* Fresh, chilled, frozen, dried, salted, or smoked

Source: FAO, Yearbook of Fishery Statistics, Vol. XX, 1964.

There is surplus of fish for export each year. From 1957 to 1963, however, the volume of exports shows a declining trend. From Table 42 we see that from 1957 to 1961 there is only a slight decline in total catch from the year 1958 and 1959, after which the total catch increases. The total catch in the year 1961 is even greater than that of the year 1957. The reason for the decline in exports is probably that there is an increase in local consumption of fish.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Summary of the Findings

The Over-All Aspects about Population of Thailand

The current population of Thailand is about 34 millions and its annual rate of growth is 3.2 percent. The actual growth within the past 50 years has been enormous. In 1911 the total population was 8.3 millions and by the year 1960 it increased to 26.3 millions, a three-fold increase. Projections made by Gille and Chalothorn indicate that the population of Thailand in the year 1980 will be between 48.5 and 54.3 millions. The number of immigrants to Thailand is small. Hence population growth is mainly due to natural increase.

The largest numbers of people are concentrated in the Northeast and the Central Plain, and the smallest number in the South. The density of population of Thailand, in comparison with many nations in Southeast Asia, is relatively low, i.e., only 51 person per square kilometer. The density of population varies in different parts of the country, with the highest density (26-75 persons per sq. km.) found in the central and the eastern parts of the country. The western border, some parts of the northern border, and almost one-half of the southern part have the lowest density (1-25 persons per sq. km).

The majority, or about 87%, of the population is rural. However, in the Central Plain only 75.1% of the total population is rural. Except for the migration to Greater Bangkok, the pattern of migration is between

different rural areas rather than from rural to urban areas.

Thailand is a nation of young population. In 1960, the median age was 18.3 and those in the age bracket of 0-14 amounted to about 45 percent of the total population. The next ratio of the population is near to perfect balance. The majority of the population are Buddhist. Although the proportion of literacy is moderate (70.8%), the level of education of the majority is rather low, as the level of education of 51.4% of the population is at fourth grade of the primary school.

The great majority of the labor force (82.3%) is employed in agricultural industries. Per capita income is relatively low (only $79). The annual farm family income is also low (only $250).

The crude birth rate in 1963 was 46.2 and the crude death rate in the same year was 19.6. Over a period of time, the crude birth rate has been increasing while the crude death rate has been declining. In terms of the demographic transition, Thailand can be considered in the demographic Pre-industrial stage until 1953. It was from this year, approximately, that Thailand first stepped into the Pre-Western stage and at present she is still in this stage.

The Population Problem

The dependency ratio of Thailand in 1960 was 124. Despite this high ratio, Thailand cannot be judged populated, because up to 1960, while the population was increasing, the per capita income was also increasing. This indicates that Thailand was still in the stage of increasing return. That is, increase in population was associated with an increase of per capita income. Besides, after considering the capacity of food production, it was found that Thailand will still be

able to feed her population for at least 15 years, even with the present conditions of production. Thus, it can be stated that at present, and at least for 15 years in the future Thailand will not be overpopulated in terms of the criteria used.

The above analysis, however, does not imply that there is no population problem. On the contrary, the high dependency ratio of Thailand, the major component of which is the young, points to many social and economic problems.

Considering economic consequences of rapid population growth, the first clearly seen is the shortage of land per person. At present the average size of a rice farm is already small, only 10 acres per farm family. The growth of population will result in even smaller farms per family, which will greatly reduce the efficiency in rice production. The farmer will become poorer and if such situations continue, hunger may occur. Inefficiency of rice production means the inability of food production to keep pace with the increasing population, which besides the shortage of food, also means the loss of a large amount of income from rice exports. Another problem which will result from the rapid population growth rate is unemployment. As Thailand is short of capital to create jobs for the increasing population, over-population in the agricultural sector will ensue. At the same time, unemployment will prevail among the industrial workers. All these conditions, when they occur, will spread poverty throughout the whole country.

Among the important social consequence of population growth, is that of health. With increasing population the existing shortage of hospitals, doctors, nurses, medical and health facilities will worsen. In education, the growing demand for manpower with higher levels of

education and skills will not be met by the educational system. Actually, even to accomplish the new educational plan which calls for an extension of compulsory education from 4 years to 7 years cannot be carried out because of the lack of various resources. Other problems relating to social welfare will also appear.

The weight of opinion on the part of certain governmental officials and scholars in Thailand has been in favor of population growth. Some argue that population growth will increase social and military power. Others argue that population growth will enhance the division of labor and promote industrial expansion. Still others are fearful of advocating a policy that may engender immorality while some assume that population growth will automatically decline. Each of these arguments have been countered with evidence or logic. The conclusion reached is that the rate of growth is already high and that steps should be taken now to avert serious social and economic consequences of present population trends.

Solutions

While a condition of over-population does not yet exist, it was found that the problems of population pressure seems to be beginning. Many problems, both social and economic are already occuring and will probably intensify in the future if the present population growth continues. The solutions proposed are of two fold: reducing the rate of population growth, and increasing food production, both to be done simultaneously.

Reducing Rate of Population Growth

The strategic point in reducing the rate of population growth is the family. Ability to reduce the size of family also means the ability to reduce the rate of population growth as a whole. In terms of social structure it is felt that the rural areas should receive the priority over the urban areas, as the majority of the population of Thailand still resides in rural areas. In terms of geographical area, it is felt that the Northeastern region should receive the first priority, since its size of the family is the largest and its per capita income is the lowest.

In order to reduce the size of family the attitudes of the people have to be changed from a preference for a large family to a small family. In the rural social structure there are many forces which enhance the preference for the large family. Most farmers see children as labor and they feel more secure in their old age, if they have a large family. Religious faith is another important factor. For instance, many farm families prefer male children in order that some of these children will become monks, which is one way for parents to receive high merit. Religious belief is also an important obstacle to the practice of birth control, because birth control runs counter to many Buddhist rules. The villages offer no social organization or recreation in which villagers participate, and farmers tend to accept procreation as an indoor game.

In order to convince the farmers to reduce family size, the conditions mentioned must be altered. The extension of years in compulsory education is one way to convince the farmers that children are not solely a good source of labor. Security programs should be established so that the farmers will not look only toward more children as security in their

old age. Social organizations and recreational centers should be set up in the villages. Religious beliefs can be modified if proper information about birth control is extended so that the people realize that there are many methods of birth control other than abortion and sterilization.

Above all, a family planning program should be accepted by the government as its policy and that sufficient funds and personnel should be provided over a sufficiently long period to guarantee the continuity and success of the program. If the government would change its attitude about propagation of birth control the family planning program would progress more rapidly. The present governmental stance which permits the propagation of birth control which is not too public dooms the program to failure. Logically this is quite impossible because the nature of propagation is public. The present attitude of the government enhances non-cooperation among all agencies concerned.

The family action research in Photharam district, under the Family Health Research Project, gives strong encouragement for similar action-research to be carried out in other parts of the country. It indicates that successful family planning in Thailand is possible in view of the change in the attitude of rural people in favor of family planning. Within the eight months of operation of the action program, there was a substantial change in knowledge, attitude, and practices concerning the limitation of family size. The proportion of women having knowledge and practice of contraception increased. Positive attitudes toward family planning also increased substantially.

Food Production

As rice is the staple food of the Thais, and it is so important to the people to the extent that sufficient rice means sufficient food,

rice production is the most important item to be considered in food production.

After considering the factors of rice production, it was found that Thailand will be able to feed her increasing population up to the year 1980, when the population will be about 48 to 54 millions, without much difficulty. Besides, there will likely be a surplus for export each year.

Apart from rice there are many other food crops. Among them are corn which can be a good substitute for rice and its volume of production can be expanded in most parts of the country. Other sources of food - buffaloes, cattle, hogs, poultry, and fish, both marine and freshwater, are also being produced to the extent that there is some surplus left for export. These sources of food seem to doubly guarantee that within the short-run, there will be no hunger in Thailand.

In order to be completely sure about the abundance in the long-run, the rate of population growth must be reduced and improvements in food production are necessary. As for the increasing of rice production the target should be to double the yield per acre. In order to accomplish this target, the following agronomic factors are necessary: new techniques in production; improved system of irrigation; better seed; improvement of soil and the application of fertilizer; pest control, and mechanization. Besides these factors there are other factors which indirectly enhance the improvement of production. These include better education so that the materials distributed by the agricultural extension officials can be better understood, more dependable markets, and more favorable prices.

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APPENDICES

Appendix A

Assumptions Applied in the Population Projections made by Gille and Chalothorn

The assumptions applied by Gille and Chalothorn in their projections of population growth are given below.

Mortality Assumptions

The projections of population growth have been prepared on two sets of mortality assumptions.

Firstly, mortality is assumed to decline at a continued rapid rate experienced in the recent years, which is around 11 per 1,000 population, up to around 1970. After 1970, the decline in mortality is assumed to be more moderate. And from 1975 up to 1980, the decline in mortality is assumed to be slightly lower than the 1970 to 1974 period.

Secondly, the decline in mortality is assumed to slow down from 1960 up to 1980.

Fertility Assumption

At present, there are no indications of decline in fertility. However, preliminary analysis of the 1960 census results seems to show that the level of fertility is somewhat lower in urban areas than in the rest of the country. As of 1960 in Greater Bangkok, ever married woman at the end of the reproductive age had on the average 5 live births, but for the country as a whole the average number of births per woman was 6.3. With increased urbanization in the future, the level of fertility in the country as a whole may decline slightly merely by the possible

adoption of the lower urban fertility pattern by a larger proportion of the total population. However, Gille and Chalothorn mention that it is difficult to evaluate how soon and to what extent this will happen within the next 15-20 years under consideration. Followings are the two sets of assumptions with regard to fertility which have been applied in the projections: (a) Continuation of the present high level of fertility, (b) A decline in fertility beginning around 1965 implying a reduction in the birth rate by one-third by 1980. The following birth rates were applied: 1960-65; 45.0, 1965-70: 41.19, 1970-75: 36.6, and 1975-80: 32.1 per 1,000 population.

For the projections of the urban population, Gille and Chalothorn assumed that the level of fertility is continue to be somewhat lower than for the rest of the country. While it is assumed in projection I (constant fertility) that the birth rate for the country will remain at 45 per 1,000, it was assumed to be 40 for the urban population. In the case of projection II (declining fertility) it is assumed that the urban birth rate will continue to be 5 points below the national rates and reach 25 per 1,000 by 1980.

The Urban Population

It was assumed that the age distribution of males and females in urban areas throughout the whole country is the same. The rates at which in-migration to Greater Bangkok took place among males and females in the various age groups were applied to the total urban population (municipalities of at least 20,000 population were considered as urban areas). Gille and Chalothorn mention that these rates only indicate the magnitude of in-migration, not net migration. It has been assumed that

out-migration from urban areas would generally be of fairly small magnitude.

Furthermore, account has been taken of the municipalities which were below 20,000 in 1960 but in period in which the projections are made, would be expected to reach the 20,000 and qualify as an urban area. It is estimated that by 1970, 17 municipalities which are now rural would be urban. By 1980 the total new urban areas would be about 30. These are the areas in which fertility would likely decline.

Labor Force

It has been assumed that the proportions of economically active males and females at various ages may change with economic and social development. Education will withdraw young people from the labor market, and industrial development will force many older people to retire. More women may be withdrawn from the labor market in particular in urban areas. Activity rates in the rural population will remain unchanged except in the age group 10-14 as the pattern of agriculture and economic customs in rural areas may not change drastically within the period under consideration. By 1980, the activity rates of the age-group 10-14 have been estimated to decline by one-third. In the urban population, it is assumed that the activity rates in the age-group 10-14, 15-19, and 60 and over will be reduced by one-third by 1980. Furthermore, for females in the urban population a similar decline in the activity rate is assumed for the intermediate age-group as well.

Birth Rates and Death Rates of the Four Projections

Considering all items mentioned above, Gille and Chalothorn gave four population projections having different rates for birth and death

as follows: "constant fertility" or "fertility decline"; "moderate mortality decline" or "rapid mortality decline", The birth rates and death rates of population growth from 1960 to 1980 in the four projection are shown in the following.

Period	Birth rate per 1,000	Death rate per 1,000	Rate of population growth per 100
Projection I (constant fertility; moderate mortality decline)			
1960-65	43.9	11.4	3.3
1965-70	43.0	10.0	3.4
1970-75	42.6	8.3	3.5
1975-80	42.2	7.1	3.6
Projection II (fertility decline, moderate mortality decline)			
1960-65	43.9	11.4	3.3
1965-70	40.3	9.6	3.1
1970-75	35.7	7.9	2.8
1975-80	32.1	6.8	2.6
Projection III (constant fertility, rapid mortality decline)			
1960-65	43.9	11.2	3.3
1965-70	42.8	8.0	3.5
1970-75	42.4	6.8	3.6
1975-80	42.3	5.8	3.7
Projection IV (fertility decline, rapid mortality decline)			
1960-65	43.9	11.2	3.3
1965-70	40.2	8.0	3.3
1970-75	35.5	6.7	2.9
1975-80	32.4	5.6	2.7

Appendix B

Stycos' Critique of the Orthodox Birth Control Movement

According to stycos, three major ideological biases have affacted the planned parenthood movement in most countries. These are the medical, the middle-class, and the feminist biases.

Because of the "medical bias" there has been: (1) emphasis on the individual or "case" rather than the group; (2) emphasis on a method designed to give maximum protection to the individual (diaphragm and jelly) rather than on those that would be most effective in reducing fertility rates; (3) undue discouragement of the simpler methods and of sterilization; and (4) emphasis on birth spacing rather than on birth limitation.

The middle-class bias, according to Stycos, is manifested in: (1) a strong "moralistic" tone; (2) a depreciation of lower class methods; and (3) emphasis on spacing and planning rather than limitation.

The feminist bias was explained by the fact that the pioneers have been ardent feminists. The consequences have been an emphasis on female methods, female patients, and justification in terms of the benefits to the female.