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ABSTRACT

This paper addresses itself to the problem of long-term manpower development in Thailand. Relevant research studies are discussed in the introduction and the thesis of this report is stated: namely, that for Southeast Asia and developing nations in general, middle manpower development, and the kinds of educational institutions needed for such development (technical colleges, junior colleges, post-secondary vocational schools, business colleges, nursing schools, etc.), should be given top priority in the decade ahead. Section II of the report develops the theme of the importance of middle manpower. Section III discusses the current status of middle manpower in Thailand. Section IV examines the middle manpower supply-demand situation for the 1970's. And section V discusses the need for a new kind of college in Thailand: a system of publicly supported 2-year colleges, which are desperately needed to meet Thailand's manpower needs and economic goals. (AF)

EDUCATION AND MIDDLE MANPOWER DEVELOPMENT

IN THAILAND

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Education and Middle Manpower Development In Thailand

I. INTRODUCTION

One of the essential factors in the economic development of nations is the attainment of a manpower mix which is strategically suited to current development problems, and which will also provide a catalyst for improvement and change. Short-range tactical considerations might dictate "crash programs" of manpower training based on models which have been successful in meeting temporary manpower needs in other countries; but deep-rooted cultural and political patterns, coupled with economic inertia, often militate against the attainment of desirable national goals with such short-range job-training programs. This paper will address itself to the problem of manpower development over the long term.

Harbison and Myers[1] have contributed a great deal to our understanding of the complexities of economic growth by their attempts at a "global analysis of human resource development." A salient feature of their analysis and of their proposed strategy is the categorization of seventy-five nations of the world into four levels of human resource development based on a composite index which takes into account (1) enrollment at secondary school level as a percentage of the age group 15-19, adjusted for duration of schooling; and (2) enrollment in higher education as a percentage of the age group 20-24. A multiplier of five was assigned to the higher education factor as an arbitrarily chosen indicator of the relatively greater

importance of high level manpower, and therefore of higher education, to economic development.* Using their composite index, Harbison and Myers then ranked seventy-five nations in four "levels" of human resource development. For each of the four levels (I, II, III, IV), they then developed "strategies of human resource development" which in their opinion would be most effective at a given stage of political and economic development.

In contrast to the Harbison and Myers studies, which put major emphasis on education as a spur to economic development, Hagen[2] emphasizes more traditional economic parameters such as natural resources, capital formation, entrepreneurship, foreign investment, tax and fiscal policies, and competition in foreign markets, while assigning to education a somewhat less important role in the overall scheme of development. Hagen argues at some length that expanded educational opportunity is just as likely to be the result of economic development as to be the cause of it.

There is a rather extensive literature now extant, most of it having appeared in the decade of the 1960's, which deals with the related problems of education, manpower, and economic development. Much of it is backed by careful research on the part of economists, sociologists, political scientists, scientists, and educators. The conclusions, of course, depend on the investigator's theoretical constructs, and on the country being studied, ranging from a predominant "human resource development" point of view at one end of the spectrum (Harbison and Myers); to a "land-capital-labor" traditional-economics point of view (Hagen) at the other. The

*Two other indicators, which assess the orientation of higher education, were also used: (1) the percentage of students in higher education enrolled in scientific and technical faculties, versus (2) the percentage enrolled in the faculties of humanities, fine arts,and law in the same year.

central tendency of the recent literature on development, is that, although traditional economic factors such as national resources, internal and external capital, and a large labor pool are certainly important factors in development, human resource development (i.e., education) is an essential factor in all countries, and in some countries it is the most important factor of all.

Typical of a group of books and studies which emphasize human resources development as being essential to economic growth are the following: T. W. Schultz in The Economic Value of Education, (1963)[3] summarizes his own studies and those of others, making a strong case for investment in education as an essential factor in economic growth. Edgar F. Denison in The Sources of Economic Growth and The Alternatives Before Us (1962)[4] develops the thesis that, if the term "education" encompasses both the discovery of new knowledge, and dissemination to the many of knowledge already possessed by the few, then education (in the United States at least) has been the most important single factor in the growth of productivity during the past thirty years. H. Correa, in The Economics of Human Resources (1963),[5] and Harbison and Myers in Education, Manpower, and Economic Growth (1964),[1] take a strong position supporting the necessity for manpower development through education. John Vaizey in Education In The Modern World (1967)[6] gives a thoughtful appraisal of the role of education in economic development, within the context of the total task which he set himself, that is to provide a "panoramic view" of current educational policies and practices around the world. Gary Becker's Human Capital (1964)[7] is almost a classic in the field of human resource development; and B. A. Weisbrod's External Benefits of Public Education: An

Economic Analysis (1964)[8] assesses the economic return to society of investments in education.

Some writers have been concerned primarily with the economic return to society; others with the return to the individual. There is general (but not universal) agreement that investment in education yields very favorable rates of return to both individual and society, in most countries of the world.

Some attempts at establishing priorities for investment as regards education vis-à-vis transportation (or some other badly needed infrastructure improvement) have been made recently by a number of well-qualified investigators. The term, "rate-of-return analysis," has been given to these investigations, since they attempt to determine, based on the premise that there are never enough resources to do all the things that might be good for an underdeveloped nation, which, among many possible investments, would provide the greatest rate of return to the economy. Is it better to build an airport or provide a new teachers' college? A harbor or a university? Or, within the educational sector itself, is it better (i.e., which will result in a greater rate of return on investment) to expand primary education in an all-out attempt to wipe out illiteracy, or to minimize educational investments at this level in order to provide a network of post-secondary technical schools? Most rate-of-return studies, or cost-benefit analyses, as they are also called, attempt to assess only the economic benefits from educational investment. Education as a "consumer good" or as a social leaven, is not a part of such studies.

Recent contributions to "rate-of-return analysis" include T. W. Schultz's, "The Rate of Return in Allocating Investment Resources to Education," in The Journal of Human Resources, II, 3 Summer, 1967;[9] and

Giora Hanoch's, "An Economic Analysis of Earnings and Schooling" in the same issue of the Journal. Also in the same journal, the entire Summer 1967 issue of which is devoted to a symposium on rates of return to investments in education, are papers by Mark Blaug, Nalla Gounden, and Martin Carnoy on analyses done in England, India, and Latin America respectively. A brief compendium, now somewhat outdated, on rate-of-return analysis, is contained in the booklet by Innes, Jacobson and Pellegrin entitled, The Economic Returns To Education--A Survey of the Findings[10] published by the Center for Advanced Study of Educational Administration, University of Oregon, in 1965.

Throughout most of the investigations referred to and in many others which space limitations preclude listing, there runs the rather clear theme that, although education per se is important, individual countries must practice different strategies of manpower development at different stages in their economic development. Indeed, some evidence exists to show that undue emphasis placed on the "wrong" level or kind of education at a given stage of development may have a negative rather than a positive effect on economic growth. Two examples serve to illustrate the point: (1) those nations which for prestige or for traditional reasons held over from colonial regimes, have strained their budgets to establish universities which emphasize the arts, law, mathematics, theoretical sciences, and advanced graduate study when the nation now, or in the foreseeable future has little economic need for emphasis in these fields; and (2) certain nations which, for political or egalitarian reasons have allocated almost all of their available resources for education to primary school development with the announced goal of "free education for all" and the elimination of illiteracy in a few years. It is of course unpopular to criticize either of

these courses of action (they are, in the currently popular phrase, "motherhood issues") but governments faced with the rock-hard responsibility for their nation's economic future may have to take the unpopular position from time to time. Either or both of the above decisions (i.e., to create a major university, or to expand primary schoos) might be defended on intellectual, political or humanitarian grounds with only the short-term in view; but for a given nation at a given time, either or both might be inadvisable--even catastrophic--on economic grounds, with long-term national goals in view.

Southeast Asia as a world region, is no exception to the thesis that education for manpower development is important and that viable strategies for each nation must be arrived at by careful planning. Choosing among "goods" is the most difficult of all choices, but developing nations must choose, since their resources are not sufficient to accomplish all "goods" within the scope of a five- or ten-year plan.

Some questions germane to strategic planning for education and economic development are posed here:

1. What are the basic, elemental resources for economic development? Agriculture, minerals and timber, fisheries, manufacturing, trade? What is their current and long-term potential for economic growth?
2. Related to (1): Whst are the sources, current and potential, of net income to the nation from exports--either of raw materials or of finished or semi-finished products embodying the "added value" from trained manpower? Can these sources be expanded and exploited? How much can "added value" in finished or semi-finished products increase net income from foreign trade? In other words,

within the limitations imposed by the maximum possible supply of basic resources, will a determined manpower development program produce enough added value, over and above the value of the basic unprocessed raw materials, to justify the cost of the planned human resources development? What might be tne rate of return on the investment to society? Will the rate of return to the individual be sufficietnly attractive to assure satisfactory enrollments in "new" educational programs?

3. What are the needs of the nation itself--in government, health, transportation, housing, welfare, communications, etc. which mandate greater human resources development?
4. What are the current and estimated future needs of the private sector? To what extent is economic inertia caused by a lack of well-trained manpower?
5. What are the cultural, religious, political, tribal, or other societal factors which must be taken into account in planning educational development? Are there certain beliefs, mores, traditions, and life styles which are likely to be destroyed if education through and beyond secondary school becomes the expectation of many? If so, what new ones will take their place? Is there a danger of creating a class of "educated unemployed" with alienation growing, pari passu with educational opportunity? If education is indeed the search for truth, and if "truth sets one free," what happens to a nation when the new (educated) generation is set free from the culture of past customs, beliefs, and traditions?

At one time the clear purpose of schools was to transmit the culture and to insure the preservation of the society. Such is hardly the case in many Western nations today, and centuries-old questions about the purposes of education still go unanswered. Each Southeast Asian nation will have to face these issues squarely and decide the relative emphases to be put on the following possible roles for education:

5-1. Education as a change agent, re-casting society.

5-2. Education as a transmitter of the culture--as a bulwark for the preservation of the existing society.

5-3. Education as a vehicle for economic development.

6. Are there cultural, religious, ethical, environmental, societal linguistic, or entreprenurial factors in operation which, though a given course of action seems rational, will doom the plan to failure regardless of good administration and proper financing?

7. If a financial commitment of considerable magnitude is to be made to education, where (i.e., at what levels) shall the priorities be assigned? Universal primary education? Emphasis on secondary education? On vocational education for adolescents? First priority to the development of a university of unquestioned quality?

In ending this introductory section the following hypothesis is introduced: It is at least possible that none of the four levels or kinds of education just cited should receive top priority, but that from economic considerations, a different kind and level of human resource development should take precedence, in the interest of more rapid economic growth. The thesis of this paper is that, for Southeast Asian and developing

nations in general, middle manpower development, and the kinds of educational institutions needed for such development (technical colleges, junior colleges, post-secondary vocational schools, business colleges, nursing schools, etc.) should be given top priority for investment in the decade ahead. The following sections of the paper develop the rationale for such a position.

II. THE IMPORTANCE OF "MIDDLE MANPOWER"

The phrase "middle manpower" first came into popular use following a conference on manpower utilization held in Puerto Rico in 1962 under the Alliance for Progress program then in effect between the United States and Latin American nations. The term was used at that time in a relatively restricted sense to describe technicians and other semi-professional workers whose jobs were principally in industries where engineers, scientists, and other professionals needed the skills and talents of technical assistants. In recent years however, the concept of "middle manpower" has become much broader and deeper. At present there is an increasing use of the term to describe occupations across a broad front of economic endeavor, including agriculture and natural resources, business, health, and human services, in addition to the industry/engineering/science field which was originally the occupational domain of the technician. Vertically, in terms of job hierarchy, the term "middle manpower" now encompasses not only the semi-professional, sub-professional, and technician levels of jobs, but has deepened to include many of the highly skilled occupations as well. The two-dimensional diagram of Chart 1 (next page) will assist in clarifying the use of the term "middle manpower" as it is now being used in the United States. The breadth of the concept is indicated by the five fields of economic activity across the horizontal dimension, and the depth of the concept is indicated by the three occupational "clusters" listed along the vertical dimension. A few examples of middle manpower job titles are listed in each box of the matrix for purposes of illustration.

Chart 1
Examples of "Middle Manpower" Jobs in Five Fields of Economic Activity
United States, 1970

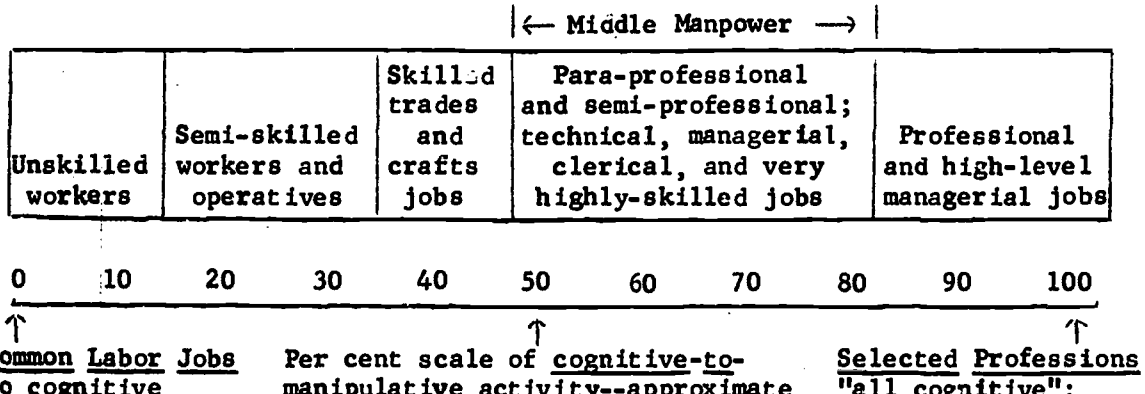
Occupational Groups (Clusters)	Fields of Economic Activity: Agriculture and Nat. Resources	Business	Health	Industry/Engr./Science	Human Services
Para-Professional Semi-Professional Sub-Professional	Agric. Research Tech. Farm Equipt. Designer Fisheries Research Technician Forestry Aide Landscape Designer Plant Propagation Technician Soils Technician Veterinarian Aide	Accountant (not C.P.A.) Advertising Designer Branch Mgr. (Bank, Store, Office) Buyer-Purch. Agent Credit/Collections Manager Insurance/Real Estate Salesman Personnel Analyst Sales Manager Salesman (Outside) Secretary Systems Analyst	Dental Hygienist Dental Lab. Tech. Medical Lab. Tech. Medical Records Technician Nurse (Registered, but non-BS degree) Operating Room Tech. Physical Therapy Technician Psychiatric Tech. X-ray (Radiologic) Technician	Aerospace Technician Architectural Design Technician Civil Engr. Technician Computer Programmer (Science) Electronics Engr. Tech. Mech. Engr. Technician Sales "Engineer" (non-degree) Science Research Tech. (Physics, Chemistry, Biology, Oceanography, Astron., Meteorology) Tech. Writer (Illustr.)	Audio-Visual (Media) Technician Fire Dept. Officer Law Enforcement Offr. Librarian Assistant Recreation Leader Sanitation Tech. Social Worker Aide Teacher Aide Urban Planning Technician
Highly-Skilled Technicians Foremen Leading Men	Agri-Business (Owner-Mgr.) Agri-Business (Salesman) Crop Duster (Aviator) Farm Mgr. (Owner) Horticulture Tech. Irrigation Specialist Nursery Operator Ranch Foreman	Bookkeeper Business Data Programmer Credit Interviewer Department Manager Owner-Mgr., Small Business Service Manager Stenographer	Certified Med. Lab. Assistant Dental Office Asst. EKG Technician Medical Office Asst. Mental Health Worker Occup. Therapy Tech. Physical Therapy Technician Practical Nurse	Air Cond./Refrig. Tech. Automotive Technician Building Construction Mech. Design Technician (Drafting) Hydraulics Technician Instrumentation Tech. (Automation) Industrial Supervisor (Foreman) Operating "Engineer" Quality Control Tech. Tool and Die Technician	Chef Dining Room Hostess Fireman Hotel/Restr. Mgr. Nursery School Operator Owner-Mgr. (Service Establishment) Police Patrolman Tourist Guide Welfare Agency Clerk
Skilled Workers	Animal Husbandry Specialist Farm Equipt. Operator Farm Equipt. Repairman Feed Mill Operator Fisheries Worker Foods Processing Plant Operator	Bank Teller Cashier Data Processing Tech. Duplicating Services Technician General Office Worker Sales Clerk Typist-Clerk	Hospital Aide Inhalation Therapy Aide	Automotive Service Mechanic Building Trades Craftsman (e.g., Carpenter, Plumber, Electrician) Heavy Equipt. Operator Machinist (Journeyman) TV/Radio Service Mechanic	Baker Barber Cook Cosmetician Service Station Attendant Waiter/Waitress

Defining middle manpower is not an easy task, since any classification of occupations is, to some extent arbitrary. It is difficult to define sharply the limits of semi-professional and technical jobs for the same reason that it is difficult to be certain of all the pursuits which can (or should) be called "professional." Job status is a sensitive issue and sny scheme of classification will be roundly criticized by some. The matrix of Table 1 will be no exception, but it is an attempt to bring some order into the newly developing spectrum of middle-level occupations. All of the following criteria have been used, individually or severally, to characterize middle manpower jobs:

1. They are jobs "in the middle"--that is, along a manipulative-cognitive scale running from "all-manual" at one end to "all cognitive" at the other, they occupy a segment where a mix of cognitive and manipulative abilities is needed. (See Chart 2)

Chart 2

Middle Manpower Jobs Located On
A Manipulative-Cognitive Scale



Note: It should be recognized that the lines of demarcation used for illustration in the diagram, do not really apply in practice. The spectrum of jobs from "all manual" to "all cognitive" is continuous, not discontinuous.

2. Generally, a period of one or more years of post-secondary education and training is required.
3. Middle manpower workers typically work with or for professional workers, or serve as liaison persons or connective links between professionals and manual workers.
4. Their work is more apt to be in design, research, planning, evaluation, testing, sales, or in human services and "people contact" activities, than in actual production of end products in a factory.
5. Although some middle manpower workers spend most or all of their time in "blue collar" pursuits, the majority of them do not. Middle manpower jobs are, for the most part in the "white collar," "sport collar" or "uniform-smock" categories.
6. Finally, the typical middle manpower worker in any of the broad areas of economic endeavor exhibits certain practical and manipulative talents not possessed by professionals in the same field; and by the opposite token, he has a grasp of theory and principles--cognitive processes--not possessed by manual workers in the same enterprise. He is, in a very real sense, the "man in the middle."

The position of middle manpower occupations within the total labor force, for the United States in a recent year, is shown (approximately) by Table 1 (next page). The percentages listed in both the 1960 and 1970 columns of Table 1 are admittedly imprecise. Neither the Bureau of the Census nor the U.S. Bureau of Labor Statistics, prepares data with exactly the same occupational category "breakdowns" as those used in Table 1. The percentages listed for both 1960 and 1975 are therefore estimates, although those for 1960 rest on a somewhat firmer foundation of known data than do

Table 1

Distribution of Labor Force by Occupational Groups
United States, 1960 and 1975 (est.)

Occupational Category or Group	Percent of total U.S. Labor Force 1960	1975 (est.)	
Professional and high-level managerial	9	12	
Para-professionals, semi-professionals, high-level technicians	3	6	↑ Middle manpower
Middle-level technicians, mid-management, foremen, leading men	5	9	1960=32% 1975=42%
Clerical, sales, and kindred, not including semi-skilled	10	14	
Craftsmen, journeymen, very highly-skilled workers	14	13	↓
Semi-skilled, and operatives in industry	20	16	
Clerical and sales, semi-skilled	11	9	
Service workers, all fields	13	13	
Unskilled workers, including farm and mine	15	8	

those of 1975. In order to arrive at these estimates, research studies, manpower analyses, and employment figures from many sources have been compared and cross-checked. Sample sources include:

1. Detailed studies of technician employment made in several states of the United States.
2. National studies made within certain job fields, such as technician utilization and demand studies made by the National Science Foundation, Engineers' Joint Council, and the National Institutes of Health.

3. Periodic forecasts prepared by the Bureau of Labor Statistics, United States Department of Labor.
4. Studies made by national associations concerned with middle manpower, such as the National League of Nursing, the National Council of Technical Schools, the American Society for Engineering Education, etc.

Even though the percentages reported in Table 1 are approximate, as "ball park" estimates they lead to the generalization that in advanced industrial nations such as the United States, middle manpower, as defined in this paper, makes up nearly one-third of the labor force, and may in another decade or two, approach one-half of the total work force, if technological and scientific advances continue. It should be pointed out that we are here discussing the employed labor force, not the total manpower pool. It is a well-known statistic that, in addition to the approximate 8 to 10 percent of the labor force which finds employment in unskilled jobs, there is another 3 to 5 percent of the manpower pool which does not find employment. Their skills, attitudes, and level of knowledge are such as to make their employment in a technologically-based economy very difficult indeed.

Applicability to Southeast Asian Nations

Generalizing from the above analysis of middle manpower in the United States to predict with a measure of certainty the middle manpower needs of Southeast Asian nations is of course unjustified. Factors which militate against a rapidly growing demand for middle manpower in many Southeast Asian nations include:

1. The nature of agriculture. Small-holder and tenant (or peasant) farming is labor-intensive, and there are strong cultural and

societal factors at work which may make technological change very slow in coming.

2. Lack of capital-intensive, technologically-based industry in some countries, and lack of a market for the end products of such an industry.
3. Relatively undeveloped systems of health and medical care (although this situation is changing rapidly in some Southeast Asian countries).
4. Control of business enterprises (in some countries) by "outsiders," resident aliens, and foreign interests with home offices elsewhere.
5. Emphasis on economic endeavors associated with extractive industries and the export of raw materials, as contrasted with significant inputs of "added value" which would come from processing these raw materials at home.
6. Finally (and this point must not be pushed too hard), a reluctance, at least up to very recent times, to look at higher education as an economic good. The idea of turning higher education to utilitarian purposes has either not been sufficiently explored, or indeed, may have been summarily rejected. In some instances "elitest" ideas about higher education may be a holdover from a colonial regime. The underdeveloped country sees that the former colonial power is an advanced industrial nation and that its educational system is based on elitism; and so the elitest educational system in effect when the colonial power pulled out has been retained. Extreme pride in the high quality of a university, for example, may be a compensatory mechanism to "excuse" the lack of effective secondary and technical education systems.

Supply and Demand

More often than we realize, in the affairs of men and nations, supply creates its own demand. Examples are legion, but one or two will suffice:

1. A small supply of rubber became available in the early 1900's, and the rubber-tired automobile thus became possible. The growth of the auto industry soon engendered a massive world-wide demand for rubber.
2. In a developing country, a hydroelectric plant is built and there is a supply of electricity where there was not before. Industry becomes electrified, electric lighting evolves from a luxury to a necessity, homeowners install electrical appliances, factories electrify their machines, and the demand for electricity skyrockets.

In much the same way the availability of a small pool of well-trained manpower often "triggers" or catalyzes a spurt of economic development which in a very short time will demand large numbers of better-educated workers. And (best of both worlds) the "added value" to economic output more often than not pays for the private and public investment in education. Once again, caution cannot be thrown to the winds--this argument of supply creating its own demand can also be pushed too far--but thoughtful decisions supported by significant investments must be made in order to give higher education an opportunity to show its promise in catalyzing economic growth. The point being made here is that just because a job survey in a given month does not show large numbers of vacancies for technicians, secretaries, nurses, draftsmen, skilled mechanics, and the like, is not sufficient justification for concluding that the country does not need middle manpower. Strangely enough, employers (including those in the public sector) often need precisely

the kind of employees whose talents are not reflected in currently published job titles and descriptions.

Education and training for jobs which now exist is education for the status quo, not for economic development. The brief history of economic development in emerging nations has already amply demonstrated that the sought-after development does not come from rapid increases in either the quality of university education or for that matter in greatly increased numbers of university graduates; nor does recent history show that instant economic development follows from all-out literacy programs aimed at providing elementary schooling for all children. These "panaceas," popular though they may be for other reasons, do not constitute the key to economic growth.

One cannot say with any degree of certainty that middle manpower education is the key, either. But evidence from a number of countries seems to suggest that this level of manpower development "fits" better into the pattern of need of "emerging" nations than either of the other two emphases.

Several Southeast Asian nations, having completed one development plan, and ready to write another, are in a good position to assess the potential contribution which emphasis on middle manpower education might make. The sections to follow discuss some of these potentials in detail.

III. CURRENT STATUS OF MIDDLE MANPOWER IN THAILAND

Thailand is a "developing country" in the sense that per capita Gross National Product is relatively low, the percentage of the labor force in (subsistence) agriculture is high, and in general, economic activity is labor-intensive rather than capital-intensive. As yet, the technological revolution has touched Thailand rather lightly.

Among many parameters for possible analysis in discussing middle manpower in Thailand the following will be chosen:

1. Distribution of the labor force by occupational group.
2. Enrollment in and graduations from various educational levels in schools of all kinds, related to population statistics and projected manpower needs.
3. Current and projected economic activity, as reflected in national economic development plans, and in "private investor" forecasts.

Data for these analyses will be abstracted from research studies, economic plans, manpower reports, and educational reports prepared by government agencies and by joint Thai-U.S. research groups. The conclusions reached from analyses of these data are, of course, subject to whatever inaccuracies may be present in the data themselves and in the methodology and the forecasts for the future contained in the several "development plans" analyzed.

Background

Thailand is a nation of nearly 35 million people, with an annual population increase of about 3.2 percent averaged over the past 10 years. Its 1980 population is estimated at about 50 million. The 1966 labor force was about 15 million, of which nearly 80 percent was employed in agriculture

and related pursuits. In 1966, manufacturing accounted for 12.2 percent of the Gross National Product. The GNP per capita in 1966 was about U.S.$130, which placed Thailand at that time in the lower third of nations of the world with regard to this parameter.*

Thailand has an abundance of natural resources, including reasonably well-watered agricultural lands, timber, a growing fishing industry, and adequate resources for future hydroelectric power development. Although money income per capita is low, there are adequate supplies of food. Poverty in the sense of inadequate nourishment is not common in Thailand, although transient effects such as drought or floods do from time to time contribute to regional crop failures and temporary food shortages in some areas.

Thailand's economy has had a healthy growth in recent years, the average annual increase in the GNP for the period 1961-1966 being 7.2 percent. This rather remarkable growth has been due in part to increased agricultural production, but also to increasing industrialization and to foreign investment and foreign aid. Tourism and other foreign spending (including U.S. spending pursuant to the war in Vietnam) has been a factor in recent years. The healthy beginnings of heavy industry are evident in the Bangkok-Thornburi area, and the construction industry has boomed in recent years to meet the demands of tourism and the rapidly escalating growth of Bangkok into a major metropolis. Infrastructure development (roads, dams, power plants, irrigation systems), though moving along, is disappointingly slow; and the balance of trade has remained unfavorable due to heavy imports of machinery, petroleum, and manufactured durables.

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*Data given in this paragraph are from Hunter,[11] and from The Second National Economic and Social Development Plan, Government of Thailand.[12]

Bangkok itself is somewhat of a phenomenon--a city of over 3.5 million people, growing very rapidly, in a nation where the next largest city, Chiengmai, has only a modest population of about 70,000. Bangkok already has all of the problems associated with large cities--slums, smog and pollution, crime, urban sprawl, unemployment, and traffic jams as severe as any in the world. Environmental problems are already there and immediate action should be taken to avert what could easily become a major urban crisis in the next decade. In Bangkok, the building construction industry (heavily labor-intensive in Thailand) is providing employment at present for thousands of relatively unskilled persons, many of them women. It is only prudent to assume that the "building boom" will level off soon, and when it does many (perhaps thousands) of these relatively unskilled persons may become unemployed. If such mass unemployment does occur, welfare and relocation problems will have to be met promptly to avoid a major societal upheaval.

Thailand presents a picture of a nation ready to move--still primarily in an agrarian economy but stirring with change; a nation with little poverty and relatively low unemployment at present, but with a great deal of under-employment; a nation which must give serious attention to human resource development to assure a viable economy for the future.

The Present Manpower Mix

Even in advanced industrial nations where middle manpower workers make up a fourth or more of the labor force, census-taking techniques and the continued use of archaic occupational categories make it difficult to sort out semi-professional, technical and very highly-skilled workers (middle manpower) for separate analysis. It is no surprise therefore to find that Thailand's manpower data do not allow for a careful analysis of middle

manpower occupations. The following pages present the writer's attempt to bring into focus the pattern of middle manpower in Thailand.

Table 2 (see next page) shows the distribution of the Thai labor force, over a period from 1954 to 1971 (estimated) by major occupational group. Reference to the percent columns reveals the labor-intensive character of the work force. With nearly 80 percent of all jobs in the "farmer" category (1966), with 6.3 percent in the "trade and craft and laborer" classification, a picture of underdeveloped manpower resources emerges. A combination of the "Professional/Technical" and the "Administrative/Managerial" categories gives less than two percent of the work force as being in what are ordinarily considered as the "high talent" manpower groups. Industrial nations typically show 12 to 15 percent of the labor force in these two high-talent occupational categories.

Table 3 (see page 24) shows the distribution of the Thai work force by economic sector for the years 1961 and 1966. Note again that nearly 80 percent of the work force is in the agricultural sector and that commerce and manufacturing combined offer employment for less than 12 percent of the labor force.

The National Economic Development Board, under the Office of the Prime Minister, prepared in 1966 a comprehensive economic and social development plan (second phase) for the period 1967-1971.[12] (This document will be referred to henceforth as the Second Plan). In this plan considerable attention was given to the need for high-level manpower during the second plan period and beyond. Projections have been made into the 1980's, based on three modes of manpower forecasting:

1. Extrapolation of long term and recent trends as observed from longitudinal studies of Thailand's manpower distribution and population.

Table 2

Employment by Major Occupational Group
Thailand: 1954-1971

Occupational Group	1954	% of total	1960	% of total	1966	% of total	1971 (est.)	% of total
Professional, Technical and Related Workers	106,240	1.0	173,422	1.3	204,040	1.4	289,180	1.7
Administrative, Executive and Managerial Workers	50,240	0.5	26,174	0.2	72,850	0.5	102,539	0.6
Clerical Workers	68,600	0.7	153,955	1.2	192,244	1.3	269,076	1.6
Sales Workers	377,800	3.7	700,100	5.5	986,114	6.8	1,325,898	8.0
Farmers, Fishermen, Hunters, Loggers and Related Workers	8,972,320	88.0	10,340,100	81.0	11,618,752	79.0	12,675,498	76.0
Miners, Quarrymen and Related Workers	10,600	0.1	25,244	0.2	33,387	0.2	43,172	0.2
Workers in Transport and Communication Occupations	65,200	0.65	142,949	1.1	216,133	1.5	306,585	1.8
Craftsmen, Production Process Workers and Laborers not elsewhere classified	356,920	3.5	776,067	6.0	912,262	6.3	1,301,309	7.7
Service, Sport, and Recreation Workers	115,160	1.1	262,786	2.0	318,353	2.1	450,941	2.7
Not elsewhere classified	77,600	0.75	80,460	0.6	--		--	
Total	10,200,680		12,681,257		14,554,134		16,764,198	

Note (1) Source: Fact Book on Manpower in Thailand.[13] Manpower Planning Division, National Economic Development Board, Bangkok, Thailand, 1967, pp. 30-31.
Note (2): The "labor force" in Thailand refers to persons 15 years of age and over who are "economically active."
Note (3): Percent columns do not total 100 because of "rounding."

Table 3

Distribution of Labor Force by Economic Sector
Thailand, 1961 and 1966

Economic Sector	F.Y. 1961		F.Y. 1966	
	Employment (in millions)	% of total	Employment (in millions)	% of total
Agriculture, Forestry, Hunting and Fishing	10.34	83.1	11.62	79.9
Mining and Quarrying	0.03	0.2	0.04	0.3
Manufacturing	0.45	3.6	0.69	4.7
Construction	0.07	0.6	0.11	0.7
Electricity, Gas, Water and Sanitary Services	0.02	0.2	0.03	0.2
Commerce	0.74	5.9	1.03	7.1
Transport, Storage and Communication	0.16	1.3	0.23	1.6
Services	0.64	5.1	0.80	5.5
Total	12.45	100.0	14.55	100.0

Source: The Second National Economic and Social Development Plan (1967-1971).[12] The National Economic Development Board, Office of the Prime Minister, Bangkok, Thailand, p. 52.

2. Selection of another country as a longitudinal "model," and assuming that the manpower mix of that country, as it developed over the past two decades, will fit the pattern for Thailand as Thailand replicates the "model" country's development over the next two decades. The country chosen as a model was Italy.
3. "Target setting" forecasting. Economists using this method set arbitrary (but in their opinion, attainable) economic goals or

targets for given years in the future, and then calculate the manpower mix necessary to implement an economy of the size and type targeted.

The Second Plan makes use of all three of these modes of manpower forecasting. Some of the conclusions reached by the planners are:

1. There will be serious shortages of professional and technical manpower, even if targets for university, college, and technical institute expansion are met during the plan period. Table 4 lists some of the estimated shortfalls for professional and technical manpower.

Table 4

Anticipated Shortages of High-Level Manpower
Thailand, 1966-1971

Persons Trained In	Anticipated Shortage by 1971
Agriculture and Animal Husbandry	750
Forestry and Fisheries	420
Medical Sciences	900
Nursing	2,000
Engineering (professional)	310
Engineering (trade-technical)	10,000
Teaching	10,000
Science	1,600

Source: Second Plan, p. 58, Table 6.

2. A big manpower gap recognized in the Plan concerns skilled craftsmen for construction, infrastructure development, and

manufacturing. The planners realize that manpower shortages in these fields are often camouflaged by the fact that poorly trained and unqualified persons are employed to fill vacancies for the reason that qualified persons are unavailable. Consequently, the shortage is even more serious than statistical evidence on job vacancies reveals, and economic efficiency suffers from under-education of the work force.

It is significant to note that, in the Table 4 listing of anticipated shortages, the following--engineering-technical, nursing, agriculture and animal husbandry, forestry and fisheries, and teaching--are all fields in which middle manpower plays an important role, and for which post-secondary training of less-than-university level is often indicated.

Table 5 (see next page) presents projections (from a different study) of future need for four "levels" of workers for three different future time periods. According to these projections, Level 2 occupations (technicians and semi-professionals) will require during the 1972-76 period an average of 16,600 new entrants per year (83,000 ÷ 5); and during the ensuing two time periods significantly greater inputs of semi-professional and technical workers. Further, if the experience of advanced industrial nations has any applicability at all to underdeveloped nations, the assumption that all the new entrants in Level 3 (skilled workers) can be trained in secondary schools has to be critically examined. Even if such an assumption is valid now, it probably will not be valid as technology begins to have a significant impact on Thailand's economy in the coming decade. The need for increased science and mathematics content, and for increased general education content will probably make it necessary in the decade ahead to provide post-secondary,

Table 5

Projected Total Number of Entrants to the Labor Force
Requiring Stipulated Levels of Education
Between Specified Time Periods
Thailand, 1972-1986

Occupational Level	Educational Attainment Level Assumed	Time Period		
		1972-76	1977-81	1982-86
1. Professionals	16th grade	60,000	80,200	98,600
2. Technicians and Semi-professionals	14th grade	83,000	90,300	116,300
3. Skilled Workers	12th grade	581,000	624,000	773,000
4. Semi-skilled Workers	10th grade	1,016,000	1,053,000	1,110,000

Source: Current and Projected Secondary Education Programs for Thailand,[14] p. 39.

Note (1): These forecasts were made on the basis of economic demand for education only. What might be desirable on social or political grounds was not a part of the forecasting procedure.

Note (2): "Professionals" are assumed to have four or more years of university education. "Technicians" are assumed to have two or more years of post-secondary training. "Skilled workers" are assumed to have the equivalent of secondary school (12 years). "Semi-skilled workers" are assumed to have completed the 10th grade.

collegiate-technical training for a significant proportion of youth who will enter the highly-skilled occupations.* However, this probability exists in future time and can be met as the need becomes evident. For the present and for the immediate future, the critical question is: How can the supply of Level 2 workers--technicians and semi-professionals--(Table 5) be brought to parity with demand?

*In this connection, see also Hunter (Ref. 11) p. 77--(Conclusion).

Potential Supply of Semi-Professional Technicians

In 1966 there were six post-secondary technical institutes in Thailand, with a total enrollment of 5,436 students. Only 2,090 of these students were in their second year of studies.* The Second Plan[12] (See p. 196) envisioned the early opening of an additional technical institute at Tak, and stated that "by 1971 the total enrollment at this educational level will be as much as 19,090 students."

It is discouraging to note that the output of the post-secondary technical institutes has not increased appreciably during the decade of the 1960's. Page 77 of Fact Book on Manpower,[13] provides the following record.

Table 6

Number of Graduates From Technical Institutes
Thailand, 1960-1966

Year	Graduates
1960	1,666
1961	1,805
1962	1,777
1963	1,517
1964	1,705
1965	1,622
1966	1,677

Compared to the estimates of need reflected in Table 5, (Level 2), and with the hopeful statement above with regard to 1971 enrollment, neither

*See reference 13, Table 37, p. 72.

the input to, nor the output from the technical institutes is at all encouraging. Perhaps there have been significant increases in both enrollments and graduates at the technical institute level during the years 1967-1969, but the gap between supply and demand evident from 1966 data is a wide one indeed. The 1966 output (1,677 graduates) compared to the estimated yearly need from 1972-1976 (Table 5) of 16,600 new entrants per year, gives a demand-to-supply ratio of 10:1! Put another way, the annual output of technicians from formal educational training is only about 10 percent of the estimated need for up-grading the Thai labor force. And, it should be emphasized, this gap concerns only technicians related to industry and engineering, and says nothing about needs for para-professionals and semi-professionals in other fields.

Teachers

Most of Thailand's school teachers are holders of certificates in education rather than the bachelor's degree. The 1967 Advance Report, School and Teacher Census,[15] shows that out of about 185,000 teachers of all levels and qualifications, teaching in all public and private schools in the Kingdom, only about 11,000 possessed the bachelor's degree or higher. For most teachers in Thailand, therefore, a preparation at less-than-university level is now, and will be for the foreseeable future, the expected pattern. Teachers are now trained (1967) in more than 30 institutions, including Chulalongkorn University, the Teachers Colleges, "village colleges," secondary schools, and in some technical institutes and agricultural colleges.

The majority of teachers trained each year are graduated from a 12th grade teacher training program. About one-fifth have 13th and/or 14th grade training, and about one-fifth graduate from bachelor's degree programs. Total enrollment at all levels in all institutions training teachers was

reported for 1966 as being about 26,700 students (Ref. 13, Table 36, p. 71). The total number of teachers at all levels, graduated (trained) in 1966 was 9,246 (Ref. 13, p. 76). By 1971 the total enrollment in teacher training must be increased above present levels by at least 12,000 in order to provide a total of nearly 50,000 additional new teachers during the plan period if the very modest targets for the 1967-71 Second Plan are to be met. (Ref. 12, p. 193, Table 3, and Sec. 8). Consequently, during the 1970's nearly 20,000 teachers per year must be trained, contrasted with the 9,246 trained in 1966.

Other Semi-Professional and Technical Personnel

Besides engineering and industrial technicians and less-than-bachelor's degree teachers, there are many other semi-professional and technical level personnel whose ranks will have to be swelled by thousands of newcomers during the next decade. Examples are:

Accountants and business data processing technicians

Audio-visual technicians

Designers and planning assistants

Foremen and estimators

Forestry, fisheries, and natural resources technicians

Hotel, restaurant, and tourism managers

Library aides

Salesmen and purchasing agents

Science research technicians

Secretaries of many levels and specialties

Semi-professionals for banking and finance

Semi-professionals for medical and dental fields

Small business entrepreneurs

Social worker aides

At present there is insufficient provision in Thailand's educational system for the training of persons for such occupations as these. For the most part they cannot be trained in secondary schools; universities do not consider these occupations as their responsibility; and technical institutes tend to specialize in industry/engineering-related programs. New "plans" will probably have to be made for manpower development in these fields.

Skilled and Semi-Skilled Workers

Reference is made in the Second Plan (12, p. 196, Sec. 26) to Thailand's need for "manpower with vocational education" and to the anomaly of declining enrollments in vocational schools in recent years in spite of the demand for skilled workers.* The mention of "declining enrollments" evidently refers to the lower vocational school level, where enrollments dropped from 23,260 in 1960 to 4,460 in 1966 (Ref. 16, Table 4.6, p. 96). At the upper vocational level enrollments were steady at about 28,000 for a number of years, and increased to 37,200 by 1966 (Ref. 16, p. 98). Holding power at the upper secondary level in vocational education has been disappointing however, and despite the enrollment increases just noted, graduates from MAW-SAW 6 have decreased from 8,075 in 1960 to 7,400 in 1966 (Ref. 13, Table 39, p. 74).

Technical school enrollments, although some increase is noted, have not grown at a rate consistent with the nation's manpower needs, as evidenced by the very slight increase from 1960 (4,887 students) to 1966 (5,270 students), as reported in Ref. 16, Table 4.8, p. 100.

It is all too obvious from these disappointing statistics on vocational education enrollments and graduates that some drastic action must be taken soon or the nation's economic development will be inhibited from a serious

*There is conflicting evidence here. Blaug[16] reports that during the early 1960's many graduates of the vocational schools in the Bangkok-Thornburi area remained unemployed.

lack of manpower at skilled and semi-skilled levels. The question is: What action? Two alternatives present themselves:

1. Assume that what is needed is "more of the same," expand facilities and faculties several-fold, and then insure full enrollments by "directive" guidance procedures, in order to meet manpower targets.
2. Make a serious reassessment of the vocational education situation to ascertain whether or not "vocational education" as it is currently organized (the "separate stream" idea) is actually the proper vehicle to carry the load of manpower development.

By no means is it certain that the first alternative is the best course for the long run. Educational planners in Thailand might well profit from some findings in other nations, including the United States, where the following general principles have been found to characterize society and education in the last two decades.

1. Youngsters (and most parents concur) are extremely reluctant to leave what they regard as the "main stream" of education to enter vocational education at an early age.
2. Occupations at middle manpower levels increasingly demand greater content in science, mathematics, and general education, which subjects are found in the academic stream, or in "comprehensive" high schools.
3. As a nation's economy becomes more capital-intensive (greater amounts of costly equipment to be used by the worker) employers demand additional maturity from employees, and young workers below the age of 18 find fewer and fewer jobs open to them <u>just because they are too young</u>.

4. Since the age of entry employment is rising in all industrial economies, there is less justification for providing vocational education at an early age. Students might well be retained in general (academic) education programs for a longer time, with vocational education beginning not earlier than the 11th grade. Thus, job training occurs in the years immediately before gainful employment, rather than in childhood and early adolescence.

5. Secondary school pupils generally are not ready to make irrevocable decisions about their lifelong careers. Consequently, secondary education programs are probably best when "streaming" or "tracking" is not too rigid, and a degree of open-endedness is retained. When a student knows that he (or she) can elect drafting, machine shop, electronics, or stenography, and still be "in the main stream" of education, he is far more amenable to sampling some vocational courses. But when faced with the decision at tenth grade (or earlier) as to whether to go the vocational school route (with very little chance of return to the main stream) or the academic route, both the student and his parents will (typically) resist the vocational stream decision.

   As the popular phrase goes, "Vocational education is a great thing--for somebody else's child."

6. Vocational education for middle manpower level jobs is best accomplished at post-secondary institutions anyway. And, even in specialized occupational programs, input from academic disciplines and from general education is necessary. Mathematics, science, economics, English, and Thai are "vocational subjects" too, and will become even more important as technology brings dramatic changes to Thai society.

It may be that not all of the six principles just listed, though they are generally applicable to free-enterprise, technologically-based economies, would apply to Thailand. But their applicability ought to be tested before massive sums of money and years of planning go into a continuation and expansion of the present system, where vocational education and academic education are regarded as separate and apart from one another. In a sense all education is vocational education, in that it prepares young people for their vocations in life. Developing countries, with scarce resources for education at best, can hardly afford the luxury of education at any level which is completely non-utilitarian. Once it is realized that both cognitive processes and manipulative processes are involved in nearly all vocations, the old dichotomy between academic education and vocational education can be dissolved. All youth will then profit from experiencing both cognitive activities and manual activities in school, and the decision as to the final choice (a vocation which is primarily cognitive or one which is primarily manipulative) can be deferred at least until the completion of the tenth grade. And, even when a decision is made at, say, age 16, there should be doors that are left open in order that lateral mobility might be possible between the upper-secondary and post-secondary "academic" and "vocational" streams.

IV. THE MIDDLE MANPOWER SUPPLY-DEMAND SITUATION FOR THE 1970'S

In attempting to pull together a synthesis of the supply-demand situation for middle manpower in the 1970's the writer is mindful of the many limitations which block the path to meaningful forecasting. A few of these limitations are listed here:

1. The dearth of longitudinal data, coupled with the lack of precision inherent in one- and two-digit occupational groupings.
2. The fact that the only really reliable and comprehensive source of information about the Thai labor force is the 1960 Population Census.
3. A lack of carefully conducted occupational surveys designed specifically to gather information about high talent manpower, including (but providing separate analysis of) semi-professionals and technicians in all fields of economic endeavor.
4. Absence of follow-up studies of graduates of colleges, technical institutes, and upper vocational schools.
5. The absence of cost-benefit, or rate-of-return studies which could indicate a direction for priorities.
6. The relatively short sojourn of the writer in Thailand--one month during the autumn of 1969.
7. The necessity to base one's conclusions on premises which are themselves uncertain, and on data which, even if accurate, come from sources ten years old.

Professor Mark Blaug, in his 1968 paper entitled The State of Educational Planning in Thailand,[16] takes a dim view of the manpower forecasting studies completed in Thailand in recent years, citing the above weaknesses, along with criticisms of the methodology used in some of the studies. Blaug's greatest

concern however is that little or no attention has been given to the concept of cost-benefit analysis. Although the cost-benefit argument is a persuasive one (obviously a nation with limited resources must spend those resources on projects expected to maximize returns) it should be pointed out that cost-benefit studies, or rate-of-return analyses, are subject to the very same uncertainties, weaknesses, biases, and inaccuracies which Blaug (correctly) ascribes to "target-setting," "other-country model," and "extrapolation-of-known-trends" methods of manpower forecasting. In this writer's opinion, rate-of-return analysis is merely one more useful "string for the bow" for educational and economic planning, not the "ultimate weapon." To be sure, cost-benefit analysis, and planned program budgeting have been very popular, especially in higher education circles in the United States and Great Britain in recent years, but popularity is not, per se, a guarantee of worth.

One serious weakness in cost-benefit analysis is that in using it the factors being evaluated (in theory) are costs of and benefits from procedures, programs, and institutions already in use. Cost-benefit analysis is therefore a technique for evaluating the status quo, and underdeveloped countries generally are more concerned with setting goals for future development (targets, if you will) than in making exact determinations of the costs and benefits (if the benefits are measurable) of present social programs.

Blaug's hypothesis that rate-of-return analysis, if applied in Thailand, would "tip the balance towards more emphasis on the lower levels of education simply because they are so much cheaper than the higher levels," (Ref. 16, p. 49) is unsupported by any evidence from Thailand itself, and in view of the high participation in primary education already attained in Thailand, it is difficult to justify. It has been pointed out in a prior section of this paper that nearly 90 percent of jobs in Thailand are in the "farmer,"

semi-skilled, and unskilled labor categories, requiring little or no formal education. The suggestion that rate-of-return analysis would indicate that greater investments should be made at "lower levels" of education, when in fact formal education beyond Pratom 4 is not really needed for these jobs, is difficult to understand. If by "lower levels," Blaug means "upper primary" and "lower secondary" schools, the suggestion still makes little sense since these levels of education would represent overtraining for the 90 percent of farm and labor jobs, and undertraining for the 10 percent of highly-skilled, business, managerial, technical, and professional jobs.

In direct contrast to the above hypothesis, it is suggested by the present writer that rate-of-return analysis, if applied to Thailand's manpower problems, would reveal that greater emphasis should be placed at middle levels of education--upper secondary schools, technical institutes, teachers colleges, business and health occupations schools, and on a new institution, the two-year college--even if this means smaller expenditures for lower levels of education and for university education.

With these remarks as a prelude, there follows an attempt to summarize middle manpower supply and demand for the 1970's.

1. With regard to the projected need for engineering/industry-related technicians for the 1970's, compared to average annual output in recent years (1960-66) of graduates from technical institutes, there would appear to be a potential shortfall of at least 12,000 graduate technicians each year during the decade of the 1970's. It is assumed that perhaps 3,000 technicians per year can be trained in industry or by other than formally organized technical institute programs. (See Tables 5 and 6)

2. With regard to trained teachers, the shortfall for the 1967-71 period is estimated at about 2,000 per year. (Ref. 12, Table 6, p. 58)
3. Data are not available to the writer on either supply or demand for the "other semi-professional and technical personnel" discussed on p. 30 above. In the aggregate, the demand for persons trained in these fields is apt to range from a few thousand annually at the beginning of the decade of the '70's to as many as 10,000 annually by 1980, if the growth goals for Thailand set by the NEDB are attained.
4. In the "skilled worker" category, need is projected (see Table 5 of this paper) at a rate of something over 100,000 new entrants annually during the 1970's, compared to a 1966 supply of less than 8,000 graduates from Maw Saw Six level vocational programs, and compared to a total enrollment in vocational education programs at all levels (but not including technical institutes) for 1967 of about 52,000 students (Ref. 18, Table 4.3, pp. 90-91). Put another way, the early 1970 need for skilled manpower is stated as over 100,000 new entrants annually, whereas the total enrollment in all of vocational education at all levels from 8th grade through 13th grade was only about half that figure in 1967.

Now it is a well-known fact that some workers at all levels (even including some professionals) acquire the necessary education and training outside formal school structures, and we must assume that such is and will continue to be the case in Thailand. But we are here concerned with economic growth, with the impact on economic growth which middle manpower can contribute, and with the role which education should play in middle manpower development. If education is to be a catalyst for economic development in Thailand, rather

than merely to serve the academic and professional interests of the favored and talented few, then we must be seriously concerned with the shortfalls which the above brief analysis reveals.

The School Enrollment Pyramid

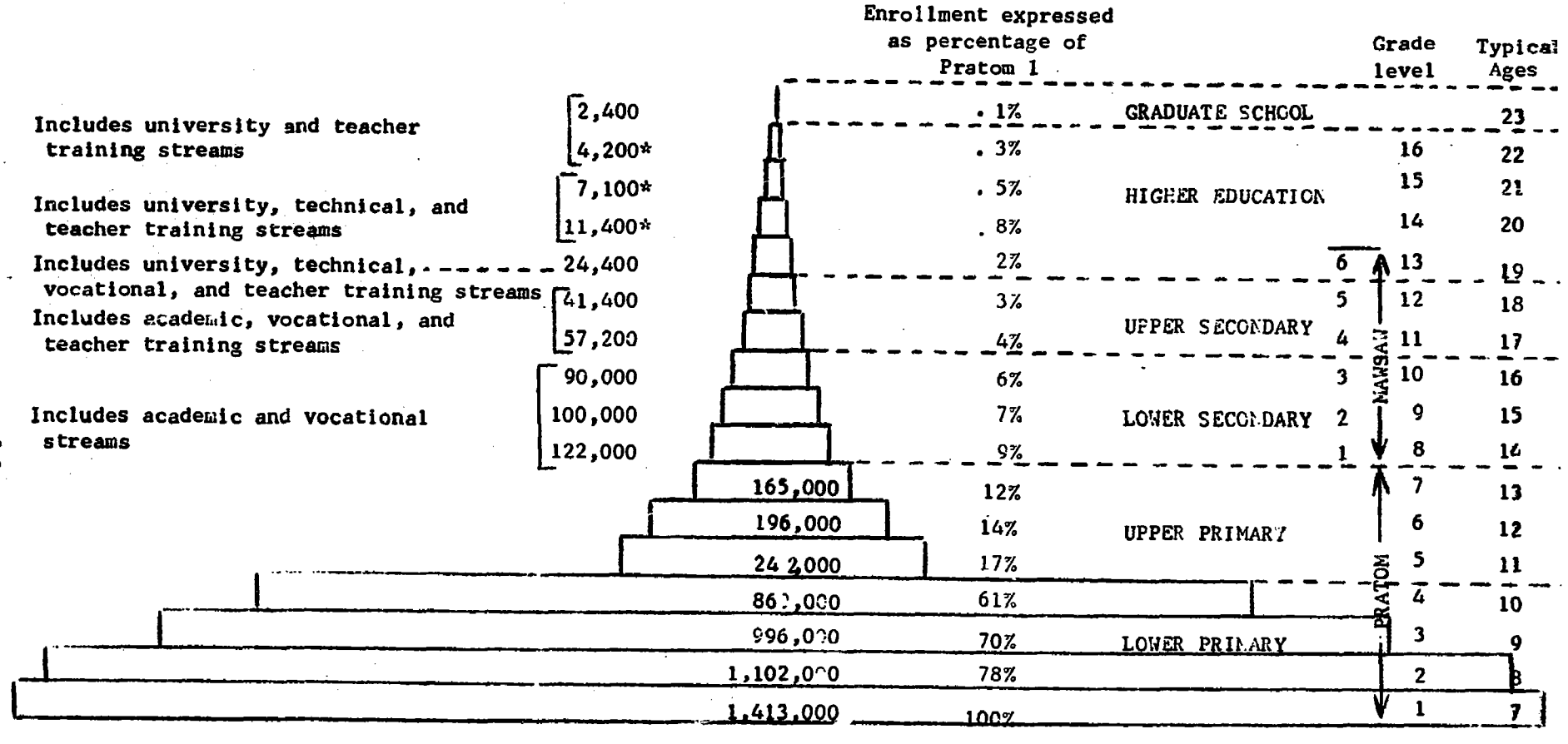
Chart 3 shows the enrollment pyramid for schools, colleges, and universities for the entire Kingdom, based on data from 1966-67, extracted from Refs. 13 and 15. Thailand is to be congratulated on the relatively high percentage enrollment in school from children in the age group 7-10 years. However, the alarming dropout between Pratom 4 and Pratom 5 (nearly 3 out of 4 pupils in Pratom 4 do not continue into upper primary school) should be of great concern. What are the reasons for such heavy attrition? Some possible explanations are listed here:

1. Insufficient "places" in upper primary schools due to lack of funding, shortage of teachers, etc.
2. Lack of interest in further education on the part of children and/or their parents. (School attendance not compulsory).
3. Curriculum not of interest except to highly-motivated, academically inclined children from the "upper" classes. (Related to No. 2)
4. Cost to the family for tuition, books, etc. incident to child's school attendance, is beyond their means.
5. Access to schools difficult in rural areas.
6. Etcetera.

It is probable that all of these "causes" are operative to some extent. If suggested cause No. 1 is the over-riding factor, then Thai planners should seriously consider the feasibility of the politically unpopular course of reducing lower primary enrollment in order to increase upper primary enrollment. From an economic standpoint, the rate of return on educational investment at

Chart 3

THE PYRAMID OF ENROLLMENTS
THAILAND 1967



Source: Educational Statistics of Thailand 1957-1967. Office of the National Education Council, Office of the Prime Minister. Bangkok, Thailand. (Ref. 16)

* Actual university enrollment data for 1967 were unavailable. The university component of these totals was computed on the basis of attrition rates of 6%, 3%, and 1% applied to first year university enrollments reported in Table 6.7 p.148 of Educational Statistics of Thailand, (Ref. 16). These attrition rates are the same as those used by the Educational Planning Office, Ministry of Education, Thailand as reported on pp. 35-36 of Ref. 17.

lower primary levels is not as high as that to be expected from investments made at secondary and post-secondary levels, if the curriculum at these higher levels includes occupational education. But secondary and post-secondary enrollments cannot rise appreciably in Thailand unless the output from the upper primary schools is doubled or trebled.

To meet the additional manpower needs projected for the second plan period (1967-1971) which require attendance at, if not graduation from secondary school (see pages 54-58 of Ref. 13), approximately 1,200,000 new secondary school-trained entrants to the labor force will be needed during the 1967-71 period. (Grand total from bottom of page 58, Ref. 13, minus laborers and unskilled workers to the number of about 300,000 listed on p. 57). This total of 1,200,000 new entrants over the five-year period indicates an annual demand of about 240,000 persons with schooling to or beyond upper secondary level. As of 1967, only about 32,000 students* were enrolled in grade 12 and presumably to be graduated during that year. The 1967-71 plan period now has only one more year to go, and the 1972-76 plan is now being formulated. These critical shortfalls should receive the earnest consideration of the "Third Plan" planners.

Without belaboring the point further it seems obvious that manpower demands of the mid-1970's, especially those defined by this paper as involving middle manpower, are not going to be met by an educational system with the characteristics displayed by the pyramid of Chart 1. The input to Pratom 5 should be doubled as soon as possible (even if enrollments in lower primary grades have to be reduced), and the survival rate into upper secondary should be trebled over the 1967 figure. Attainment of this second objective may be

*From Ref. 18, adding 12th grade totals from Tables 3.5 (academic) and 4.7 (vocational).

possible only when significant changes are made in the curriculums of lower secondary and upper secondary schools. In line with an earlier suggestion, the two-stream philosophy should be critically examined, and the curriculum of the upper "academic" secondary school should be reviewed with a view to broadening it beyond the purely academic courses needed for university preparation.

By 1976 the number of children moving into Pratom 5 should be of the order of 600,000; Maw Saw 1 should see an enrollment of over 300,000; and Maw Saw 4 (grade 11) an enrollment of 150,000. Some residual "streaming" might still be necessary at lower secondary levels, but every effort should be made to attain an operational plan by 1976 which would educate all children in a single "stream," combining academic and some practical arts education, up through grade 10 (Maw Saw 3). Vocational education for semi-skilled and skilled occupations could begin with grade 11 (Maw Saw 4). Post-secondary technical institutes should be open to qualified graduates from both (upper secondary) vocational schools and academic schools. Two-year colleges (junior colleges or community colleges), if they are established in Thailand, should be "open door" comprehensive institutions offering a wide choice of curriculums to students at differing levels of ability and interests. By 1976 the total enrollment in higher education at all levels (grade 13 and above) in all kinds of institutions (universities, teachers colleges, technical institutes, agricultural colleges, and junior colleges if established) ought to be in excess of 100,000 students.

Projected Economic Developments--Manpower Implications For The 1970's

The Thai economy is largely a free enterprise one, although the government exercises a measure of control over business enterprises and has

an important role in planning, in infrastructure development, and in creating a climate conducive to foreign investment.

Gross National Product (GNP) is expected to grow at an average annual rate of about 7 percent throughout the decade of the 1970's. A slow but steady structural shift is now evident, and is expected to continue, in which agriculture's share of the GNP is dropping and may fall below 25 percent of total GNP during the late 1970's, while still maintaining growth in absolute production. The percent of the total labor force engaged in agriculture is expected to drop to 75 percent by 1971, and to perhaps 70 percent by 1980. As agriculture declines in relative importance (but not in absolute production), compensating increases are expected in such economic sectors as manufacturing, construction, transportation and communications, banking and finance, and wholesale and retail trade.*

If we accept, on the whole, the predictions of the Second Plan,# some implications for education and manpower development can be inferred. Manufacturing requires technicians, foremen, managers, and skilled craftsmen; construction requires surveyors, estimators, draftsmen, engineering technicians, and skilled trades workers; transportation requires engineers, operators, dispatch clerks, warehousemen, mechanics and repairmen; communications requires electronics technicians, producers, writers, editors, newsmen, pressmen,

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*The discussion above has been adopted from the Second Plan (Ref. 12), pp. 29-36.

#The writer is in general accord with the Second Plan predictions, but offers four comments for consideration: (1) In the drive for industrialization, avoid the mistake of neglecting agricultural development and diversification. (2) Avoid relying too heavily on tourism as a source of foreign exchange. (3) The construction industry (hotels, office buildings, etc.) is an up-and-down industry and it should not be assumed that it will continue to "boom." (4) The serious lack of infrastructure development must be remedied as soon as possible.

photographers, and secretaries; and banking, finance, and commerce require a host of persons trained in many facets of business education. As one ponders the job demands involved in these "future growth" areas of the Thai economy, the need for middle manpower training emerges with stark clarity.

Industrial Development

Some of the major industries now contributing to the Thai economy, according to the Ministry of Industry, are:

1. Petrochemicals. Thailand has three petroleum refineries with a total refining capacity of some 55,000 barrels per day. Except for a very small producing field in the north, and possible future developments from deposits of oil-bearing shale in the northwest, Thailand's petrochemical industry must rely on imported crude. The nature of the petrochemical industry in Thailand, as elsewhere, is capital-intensive, and it does not create large numbers of new jobs. Most of the jobs which are associated with petroleum refining are, however, at technical and highly-skilled levels.
2. The sugar industry. Cane growing and sugar refining in Thailand is largely under the aegis of the Thailand Sugar Corporation, Ltd., a quasi-government corporation. In recent years Thailand has become a sugar-exporting nation, but due to problems of scale and the exigencies of the world sugar market, any great expansion of the sugar industry in the near future is not anticipated. Manpower demands of this industry include some technical-level personnel, some highly-skilled people, and larger numbers of semi-skilled (operators of machinery, etc.) and field laborers.
3. Gunny bag manufacturing. This is a large industry, with twelve or more factories, some private, some government owned. Capacity in

1966 was about 50 million bags, slightly in excess of domestic requirements. Jute and kenaf production in Thailand is enough for a great deal of further expansion of the gunny bag industry as it enters the export market. Jobs in this industry involve management, clerical and sales, technical knowledge and skills, mechanical skills, and semi-skilled manipulative activities.

4. The cement industry. Total production of cement is expected to exceed 2 million metric tons annually in the early 1970's. This industry is already in the export market, and expects to continue to grow as the demand for cement increases in Southeast Asia. It is a capital-intensive industry and does not require large infusions of new manpower. Technicians, skilled craftsmen, and semi-skilled operators make up the bulk of employees.
5. Textile production. This industry has been growing rapidly in recent years, and except for certain specialized and luxury materials, Thailand expects to be self-sufficient in textiles in a short time. In at least one specialized field (Thai silk) a sizeable export market already exists. Again, manpower needs center around technicians, artists and designers, mechanics and machine operators, along with managers, and clerical and sales personnel.

Among new industries being planned as government enterprises are: food storage and processing (refrigeration), fiber-board production, crepe rubber production, glass manufacturing, and fertilizer manufacturing.

In addition, further development of power resources, natural resources development, and transportation and communications development are high on the agenda of public sector projects for the 1970-1980 decade.* All of these

*Material for the several paragraphs above is from Ref. 19.

planned developments will require technicians, clerical personnel, mid-management workers, and highly-skilled craftsmen.

Private sector industrial development is encouraged in Thailand under the Promotion of the Industrial Investment Act of 1962 (Ref. 20, p. 17). The following industrial activities have been singled out by a U.S. AID mission as having good potential for private sector development during the next decade:

1. Manufacture and marketing of agricultural machinery.
2. Production of hand tools and small machine tools.
3. Manufacture of electrical equipment and pumps.
4. Food processing and canning, especially sea foods.
5. Manufacture and marketing of small appliances such as fans, irons, refrigerators and air conditioners.
6. Fertilizer and industrial chemicals manufacturing.

In these planned developments also, the need for middle manpower will be critical right from the start.

Summary--Projected Economic Development for the 1970's

Projections and plans for both the public sector and the private sector point to growth in the next decade of economic enterprises which will demand significant increases in high-level and middle-level manpower. Not only will development provide more jobs for high-talent manpower, development will be inhibited severely unless high-talent manpower is available. A supply of high-talent manpower must be available before significant development can begin. Here is a case where supply creates its own demand.

From the many studies, reports, and plans cited, it seems conservative indeed to predict that for the decade of the 1970's Thailand must produce at least 1 million new entrants to the labor force whose education and training will qualify them for satisfactory performance within the middle manpower

spectrum, as defined in a prior section of this paper. At the average rate of 100,000 new workers per year, these products of the Thai education system should be trained almost entirely at post-secondary collegiate-technical levels, and they would be distributed across the five major fields of economic endeavor shown horizontally on Chart 1--agriculture, business, health, industry/engineering/science, and public service--and mostly among the first two vertical "levels" there described. The existing (and perhaps expanded) secondary-level vocational school system would continue to train semi-skilled workers and skilled workers for the trades and crafts.

As of 1967, the total output of technicians and semi-professionals (including non-bachelor degree teachers) from the Thai education system (public and private) probably did not exceed 30,000 per year. Meeting the target of 100,000 per year for 1971 and beyond, will therefore require a massive new effort, by expanding on-the-job training, by establishing new technical institutes and teacher training colleges; and by expanding upper secondary vocational schools both in numbers of students and in new curriculums. But more important than expanding any or all existing institutions, in the writer's opinion, is the necessity to introduce a completely new educational institution to Thailand to accomplish a dual purpose: (1) to provide the long-term solution to the middle-manpower problem, and (2) to make access to higher education possible for thousands of Thai youth now denied that opportunity. This institution is the two-year college, or junior college, or community college, as it is variously known in countries such as the United States, Canada, Japan, Chile, and Ceylon where many such institutions now serve youth and adults.

The concluding section of the paper deals with a proposal to establish two-year colleges, and closes with a set of specific recommendations.

V. A NEW KIND OF COLLEGE FOR THAILAND

Reference has been made at several points in the foregoing pages to the unavailability of precise data and to the necessity of having to rely too heavily on studies whose basic data and methodology may both come into question. The conclusions and recommendations of the present paper may indeed be based upon a mass of conflicting opinion siphoned from a swamp of inaccurate data. It would be best therefore to look upon this paper as a "think piece," rather than as a body of careful research standing on a foundation of solid information.

Uncertainties notwithstanding, the welding of fact and opinion which has been analyzed above, suggests with some forcefulness that economic growth of the magnitude desired in Thailand will not take place within a manpower vacuum; and that even very modest manpower goals[21] will not be reached merely by a continuation of present educational policies. "More of the same" might prevent retrogression, but it will not bring progress. Some kind of "quantum jump" is needed at this point in time, and it is suggested that the establishment of a system of publicly supported two-year colleges might well be the necessary catalyst to initiate a controlled "chain reaction" for manpower development.

What are some of the characteristics of two-year junior (community) colleges?[22] A partial list follows:

They are post-secondary, beginning at grade 13.

They are comprehensive, offering both academic and occupational education.

They are low-cost, "open door" institutions, located near centers of population, making access to higher education available to large numbers of youth and adults. Though admission to the college itself is "open door," the student may have to take "remedial" courses before being admitted to the curriculum of his choice.

They may offer the first two years of (academic) college education from which a student may "transfer" to a university; and they ordinarily offer technical, semi-professional and vocational programs for broad clusters of occupations in business, health, industrial/scientific/technical, and public service fields.

Their programs lead to graduation with the associate degree or an appropriate diploma.

They offer guidance, counseling, and job placement services to students and former students.

They may offer "remedial" studies for the educationally disadvantaged, either youths or adults.

They are involved in the community, and in its unique educational and manpower development needs--both public and private sectors.

Their emphasis is on teaching, not on research.

Although higher education of any kind is never "cheap," two-year college costs, on an annual per-student basis, are ordinarily far below university costs, and appreciably below technical institute costs.

They may range in size from a few hundred students, for a college in a small community, to several thousand students in colleges serving metropolitan areas.

Their purpose is to make post-secondary education an expectation, and eventually a reality, for perhaps half of the youth of the nation. They are directly concerned with manpower development at the precise levels most needed by "developing" nations.

The Two-Year College and Existing Institutions, Contrasted

There is, understandably, always a reluctance to create a new institution if its avowed purposes could be effectively accomplished within the framework of existing institutions. Educational planners in Thailand might agree with most of the needs discussed in this paper, but they might propose other ways of meeting those needs, to wit:

1. Build more technical institutes, expand existing ones, and provide for semi-professional and technician manpower in this way.
2. Build additional Maw Saw 6 facilities and triple the output of highly-skilled craftsmen by this means.
3. Establish a number of business institutes or colleges to produce secretaries, accountants, salesmen, computer programmers, and middle management personnel for business.
4. Establish a number of new colleges for the training of para-professionals for health occupations.
5. Ditto, for the human services occupations.
6. Continue (and expand) teacher training as a function of the secondary schools.
7. Establish several new university colleges to provide opportunity for the thousands of qualified applicants who now cannot be admitted because of lack of places.
8. Etcetera, all within the existing milieu.

There are a number of very compelling reasons why the comprehensive junior college idea represents a better solution to economic and social development than the alternative courses recognized above. In brief, the following are worthy of consideration:

1. Many (perhaps more than half) eighteen-year olds have not made a career decision. They need some career guidance, and a chance to "sample" college subjects briefly before deciding for business, technology, health, teaching, or other occupation.
2. Most college-level occupational programs should include academic courses in science, mathematics, languages, or the humanities. In a junior college these are readily available, and class size can be maintained at economic levels. Such is usually not the case when separate schools are maintained for each occupational specialty.
3. The two-year comprehensive college avoids the "forced tracking" which is anathema to many youth today.
4. For the baccalaureate degree-bound student, the two-year college offers an opportunity to test his ability for university-level work. If this ability is lacking, he can easily move into one of the college-level occupational programs.
5. Economies of scale can be realized, since student bodies of a thousand or more are easily attained. Specialized colleges, on the other hand, tend to have low enrollments and high unit costs.
6. Capital outlay costs per enrolled student tend to be less than those for specialized colleges, since student station utilization and space utilization, campus wide, can be much higher.
7. General education for citizenship, and the values of interdisciplinary contacts can be maximized. The technician meets and knows accountants;

the nursing student makes friends with the mathematics major; and the future teacher gets to know the air conditioning technician. All share in a common student body citizenship, and in a common core of general studies.

8. There is some evidence that, on an annual per-student basis, costs of instruction are lower in comprehensive institutions than in specialized institutions. The differential is not great, and it is the result of the (usually) fuller classes in comprehensive institutions.
9. Flexibility, to meet changing manpower demands, is an attribute of comprehensive junior colleges.
10. Higher education, through the two-year college, becomes an economic good, for the benefit of the entire society, rather than a scarce commodity to be rationed out to the fortunate few.

Final Recommendations

1. That a national system of junior colleges be established in Thailand, in order to maximize middle manpower development.
2. That the system be planned as a part of the Third National Economic and Social Development Plan, 1972-1976.
3. That the system be operated by the National Education Council.
4. That six such insitutions with a total full time equivalent enrollment of 18,000 students be planned for full operation by the end of the Third Plan period.
5. That three of the first six colleges be located in the Bangkok-Thornburi area, and the other three be located in regions identified by the N.E.C. as areas meeting two criteria:

5.1. Large numbers of students are available and desirous of attending.

5.2. Middle manpower development is sorely needed.

6. That tuition and fees to the student be kept as low as possible--not more than one-third of the actual annual unit cost per student, and with scholarships available for qualified students of low income status.

7. That these colleges be comprehensive in the sense that they will offer a good selection of occupational programs in at least four of the five areas shown on Chart I, and also will offer the first two years of university-parallel work for students desiring to continue on to a baccalaureate degree.

8. That, upon successful completion of a two-year curriculum, a suitable diploma or an associate degree be awarded, as: Associate in Arts, Associate in Business, Associate in Applied Science, etc.

9. That, although a policy of open admissions for all secondary school graduates be maintained, each curriculum will have standards consistent with the career or job for which it is designed. Remedial courses may be required of students before they can enter "regular" courses in certain curriculums.

10. That career guidance and counseling services be provided for all students.

11. That each such college maintain continual and effective liaison with both the public and private sectors of the economy in its region, to the end that middle manpower development education at the college will be realistic and effective.

12. That faculty and administrator salaries be fixed at levels which will attract and hold persons of high talent and dedication. Junior college faculty members must be paid a professional salary, so that "moonlighting" will be unnecessary. Their full-time energies will be needed on the campus.

13. That annual studies be made of middle manpower supply and demand in Thailand, and that the results of these studies be used in curriculum planning.

14. That, although, the central administration for the junior college system be a part of the National Education Council a good measure of local autonomy and freedom of action be reserved for the local campuses. The functions of the "central office" should be coordination and service, not day-to-day direction and control. Line-item budgeting should be avoided.

15. That Chulalongkorn University, through its faculty of education, cooperating with its several other faculties, be asked to engage in a special program of junior college teacher preparation, if the decision is made to establish a junior college system.

16. That a suitable goal for 1981 (end of the Fourth Plan period) would be fifteen colleges with a total full-time enrollment of 45,000 students.

17. That complete records, including as a minimum the following, be kept on the system from its inception:

    17.1. Capital outlays (to be amortized over time periods consistent with Thailand government policies).

    17.2. Annual per-student operating costs, by college, and by curriculum.

17.3. Numbers enrolled in, graduates from, and dropouts from the separate curriculums.

17.4. Results of annual follow-up studies on students--placement in jobs, earnings, etc. These should be done for all students--graduates, transfers to university, and dropouts.

17.5. Specific contributions to manpower development and economic development, of the several colleges and curriculums.

From these and other data, cost-benefit analyses to be made on the system, beginning about 1978.

18. That Thailand's universities accept the responsibility to assist in the planning of the academic curriculums of the two-year colleges, and that the universities be prepared to accept all qualified transfer students from the two-year college system. ("Qualified" to be interpreted to mean the successful completion--"pass" or "honors"--of a two-year college-parallel or academic curriculum.)

19. That the National Education Council make, or cause to be made, a "master plan" study for the establishment, financing, and operation of the proposed system of two-year junior colleges.

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